JULY 30, 1956

STEEL
The Metalworking Weekly

A PENTON PUBLICATION

MORE SALES
from distributors, agents

How manufacturers can work better with independent sellers . . . p. 59

✔ More New Motors To Come . . . p. 92

✔ Supply Crimps Foreign Trade in Steel . . . p. 137

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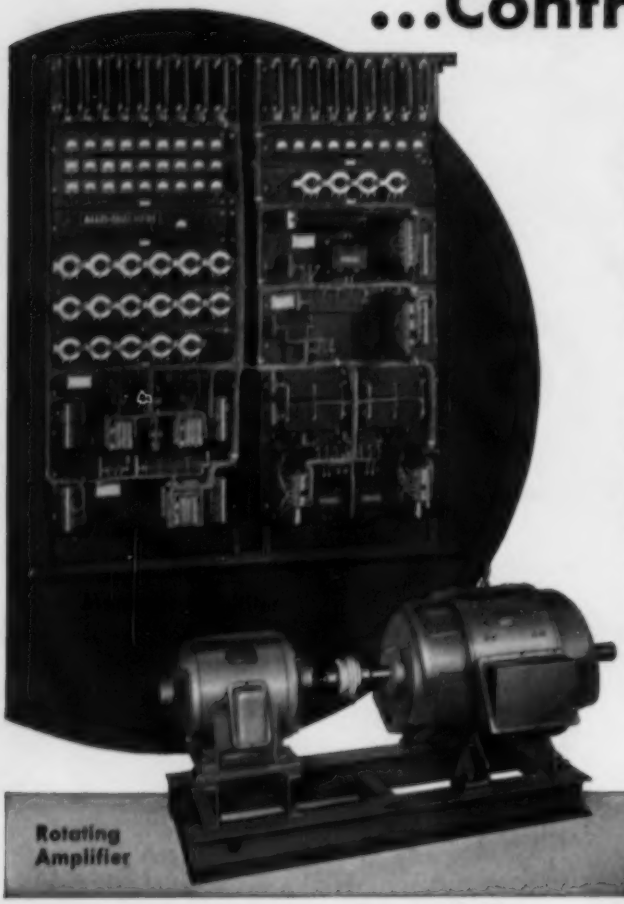
You get **MORE** when you Specify Allis-Chalmers

...More Mill Production ...Control Over Quality



Rotating Amplifier

The most important factor in meeting the challenge of more tonnage and improved quality is effective regulation. And effective regulation is more than a matter of good regulator design. It embraces overall *system* design . . . the integration of generators, exciters, motors, regulators and other control equipment. As manufacturer of all these interdependent components, Allis-Chalmers is in a unique position to provide this practical approach to mill regulation.

"Coordineered" System

Allis-Chalmers maintains separate departments, staffed by specialists, for each product. "Coordineering" results from an interdepartment exchange of ideas and technical information correlated in *one* department specializing in metals-producing industry application. All components are matched to meet the requirements of your job. Responsibility for system performance rests with one company.

For complete information, see your Allis-Chalmers representative or write Allis-Chalmers, General Products Division, Milwaukee 1, Wis.

A-5029

ALLIS-CHALMERS

Regulators

Three Types of Regulators Available

The following types of regulation are "coordineered" into an Allis-Chalmers system:

1. ***Regulex* Rotating Amplifier** — Applicable where high power levels for reversible output are desired.

2. **Magnetic Amplifier** — Applicable where low power levels for reversing or high power levels for non-reversing are desired.

3. **Combinations of *Regulex* Rotating and Magnetic Amplifiers** — Each complements the other for maximum efficiency.

Analytical Facilities Utilized...

System performance is simulated in the computers to get optimum configuration of components. The constants and exciter ceilings necessary for desired response are established.

Regulex is an Allis-Chalmers trademark.

ALLIS-CHALMERS

Another Big One on the Way

This glowing mass of steel winging through the air is a large forged roll in the making. As you see it here, it has been blocked and reheated, and is now en route to the second forging operation. When the Bethlehem shops have finished with it, the roll will have a maximum diameter of 36 in. and a length of 10 ft. It will weigh 21 tons after finish-machining and grinding. The customer plans to use it for hot-rolling aluminum.

Rolls like this require the most painstaking care in every detail of manufacture. At Bethlehem they get it. Steel-making, forging, heat-treating and machining are all in expert hands, and the strictest metallurgical controls are enforced throughout. When a Bethlehem roll emerges from the shops, it meets all specifications on size, finish, hardness. It's ready for action.

Whatever your needs in rolls, we can meet them to your entire satisfaction. Call us if your operations involve cold-rolling ferrous sheets and strip . . . running-down and finishing steps on copper and brass sheets . . . hot- and cold-rolling aluminum sheets . . . cold-rolling aluminum foil.

BETHLEHEM STEEL COMPANY
BETHLEHEM, PA.

On the Pacific Coast Bethlehem products are sold by Bethlehem Pacific Coast Steel Corporation. *Export Distributor:* Bethlehem Steel Export Corporation

BETHLEHEM STEEL

BETHLEHEM STEEL

Braze it for 4¢ with TOCCO*

Willey's Carbide Tool Company, Detroit, reports the following benefits from TOCCO *Induction Brazing* of tool tips:

1. *Large lathe tools:* **8 times as fast.** *TOCCO brazes 85 per hour; former method 80 per day.*
2. **Cost cut from 58¢ to 4¢** *for each large tool.*
3. *Small tools (¾" to ¼" square):* **TOCCO brazes 250 to 400 per hour.**
4. *Two 15-KW TOCCO machines* **paid for themselves in three months.**

Mail coupon for information on many other brazing applications where TOCCO saves important time and money.

THE OHIO CRANKSHAFT COMPANY

TOCCO

Mail Coupon Today

NEW FREE BULLETIN

THE OHIO CRANKSHAFT CO.
Dept. S-7, Cleveland 5, Ohio

Please send copy of "Tool Tipping with TOCCO".

Name_____

Position_____

Company_____

Address_____

City_____ Zone____ State_____

Traveloader does a job here no other handling machine can do!

Traveloader easily picks up long, awkward loads from the side and carries them securely and speedily to near or distant points—without changing travel direction. This unusual feature enabled a large mid-western steel company to set up a highly efficient system for handling and yard-storing heavy curved corrugated steel plate sections.

Unit loads weighing up to 9,000 pounds are placed on the Traveloader by overhead crane at the fabricating department, transported to storage area and tiered along 12-foot aisles. As needed, sections are picked up by the Traveloader and delivered to the shipping platform. A special attachment permits handling of single sections or "split lifts."

As a direct result of this method the company uses yard space to much better advantage, fills orders faster and substantially reduces handling manpower.

The Traveloader also handles pipe, lumber, loads weighing over 4,000 pounds and any awkward loads. It does yard maintenance work, positions machinery and performs many other handling jobs not practical or possible with any other equipment.

★

Write for Bulletin 1360. It completely describes the remarkable TRAVELOADER that carries like a straddle truck, delivers like a road truck, and stacks like a fork truck.

Baker handling equipment

THE BAKER-RAULANG COMPANY

1259 WEST 80th STREET • CLEVELAND 2, OHIO

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675

This NEW Magnetic Counter is EASY to Reset...

Added Evidence that—

Everyone Can Count on VEEDER-ROOT

Designed for panel mounting where remote indication is required, this electrically operated counter is a compact package 5.5″ long, 2.1″ wide, 2.7″ high. Capacity: 1,000 counts per minute. Power consumption, 8 watts. Stocked in 110 and 220 AC and DC. Easy to reset, except when locked . . . then the sturdy tumbler-lock* puts the damper on tampering. Yet one turn of the key resets all 6 figures to zeros.

This new Magnetic Counter is one of the thousands of Veeder-Root standard and special counters . . . electrically, mechanically and manually operated . . . in daily use throughout the world in industry, business, science and medicine. You, too, can count on Veeder-Root . . . to help you count anything you need.

*National Lock Co. Lock No. 68-4837; Key D-428

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"THE NAME THAT COUNTS"

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The Metalworking Weekly

July 30, 1956 Vol. 139 No. 5

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BAM!

5 operations in 1 stroke!
SAVING 37%

A leading maker of bottle-washing equipment* came to Presteel with a pressing problem. Their milk-bottle carrier had to be made quickly, in quantity, at low cost. Yet the job called for 5 press operations.

Could Presteel cut the problem down to size? We went to work, and produced a stroke of genius! One stroke of a large-bed press stamped the finished part in seconds, rolled 5 operations into one.

Result? Savings of 37% over multi-operation methods . . . from the start. Speedy delivery — just 2 working days. Are YOU disturbed by a pressing problem where cost is a big factor? Bring it to Presteel and save! Send us the coupon below.

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Get a quote from the leader — PRESTEEL!

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Please ask your representative to call ☐
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Title _____ Company _____
Street _____
City _____ Zone _____ State _____

behind the scenes

Push Those Sales

Did you ever contemplate $9 billion? In either American or French numeration a billion represents one thousand million, a solid bundle of jack no matter how you look at it. If you wanted to tile football fields with 9 billion unused dollar bills, you could cover 22,353 football gridirons solidly, and up to the 50-yard line on the 22,354th.

Why all this excitement over a lousy $9 billion? Because that figure represents the total metalworking sales to be made by independent sellers this year, and because industry is in danger of getting crossed up with these people, that's because why. The story (page 60) tells how you can have better relations and better sales from your distributors and agents. Executive vice presidents and sales managers will find some real meaty stuff here.

Associate Managing Editor John Morgan, who researched and assembled the article, manfully restrained his enthusiasm when we slunk into his office and inquired about this distributor deal.

Said Honest John: "Distributors and other independent sellers account for a $6 billion chunk of metalworking's total sales. And I may say," he added, breathing deeply and abandoning grammatical discipline, "six billion dollars ain't hay, Mac!"

Boiling Briton

Now that he has re-established himself among his law-abiding peers, and has publicly renounced his criminal ways, the story may be told about Associate Editor Mike Webster's brush with the law. Mike is a transplanted Briton who switched from blue paint to suntan in easy stages, and eventually found himself in the far suburbs wrestling with a mortgage like everybody else. Hands accustomed to swinging a cricket bat now grasped the shovel and the hoe, and soon Mike was literally up to his neck in a lawn. This old situation came about because he dug a trench to lay a sewer line, and one day as he paused for a moment, his eyes rested on a pair of large, square boots about 3 in. from the end of his nose.

The owner of the boots inquired if Mike had bought a permit to lay a sewer line. Mike replied that surely, in the land of the free, a man could dig holes wherever he wished in his own property, but the man in the boots, who also wore a star, said in a pig's eye he could, not without a permit first.

Mr. Webster bristled; he felt that the boots were stomping on the Magna Charta, but eventually he bought the permit and completed his sewer.

For Women Only

The editors of STEEL are always striving to improve their product. They never let up, because it's part of their job. It occurred to us one day, while idly bounding about on our pogo stick, that nobody ever asked the ladies what *they* think of STEEL. How many women read this magazine, anyway? Would they like to say something about the way the editors are running it, or how the artists are illustrating it, or how the advertisers are making their pitch?

You never can tell what'll come from a survey like this. The brainstorming set, folks who deal in wild ideas by the bushel, have no idea that ol' Shrdlu is out tapping feminine opinion. If we know women (what a silly remark! Who *does*?) we might just stir up enough ideas to lift the business publication business so far above its path of solemn dedication we'd all have to abandon public and private means of transportation, and go to work in the future by kite.

How about it, ladies? May we have your opinions?

Sapient Symphronsibah

Just before little Symphronsibah gobbled up her bowl of alphabet soup, she noticed, floating among the spinach, 9 M's, 28 I's, 24 S's and 8 P's. "I wonder," murmured the little tyke, "how many ways I can pick out and arrange these letters to make the word MISSISSIPPI?"

Shrdlu

(Metalworking Outlook—Page 43)

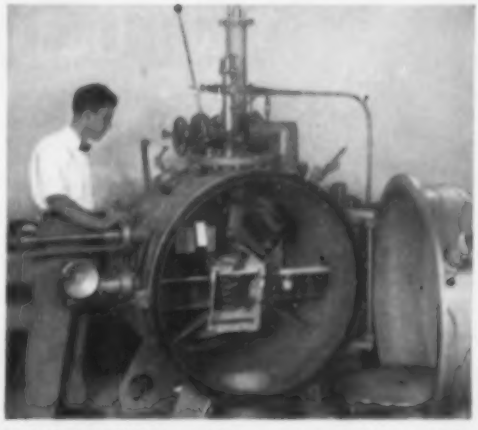
Will Vacuum Melted Metals do for YOUR Product What They do for Radar?

A Vacuum Furnace will help you get the Answer

Vacuum melting produces metals and alloys having unique properties of reproducibility, homogeneity, cleanliness, and ductility with impact and fatigue strength. Alert engineers are upgrading their products and cutting costs by taking advantage of these properties.

For instance, Radar benefits from tubes made of vacuum melted component parts. Improved machinability and reproducibility assure precise electrode dimensions and composition, which give more consistent tube characteristics. Greater thermal and electrical conductivity and elimination of "outgassing" increase tube life.

Would such metals make *your* product better? A vacuum furnace will enable you to develop materials especially suited to your needs. We have made and operated more high vacuum furnaces than any other manufacturer in the world. Can we help you, too? Send coupon below today.



NRC Model 2555 Vacuum Furnaces are now being used by aircraft companies, engine manufacturers, investment casters, specialty steel producers to speed up development of new materials that will meet ever more severe operating requirements.

NRC high vacuum products include: dehydrators, freeze driers, gas analyzers, impregnators, gauges, metallizers, pumps, valves, vacuum furnaces.

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Have your representative call ☐

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Company.....
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City.....Zone.....State.....

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ONE OF THE NATION'S
LARGEST AND MOST MODERN
PRODUCTION FOUNDRIES

ESTABLISHED 1866

THE WHELAND COMPANY
FOUNDRY DIVISION

MAIN OFFICE AND MANUFACTURING PLANTS
CHATTANOOGA 2, TENNESSEE

IT'S EASY to reduce annoying and expensive oil leakage like that shown here. The simple act of switching to a Suntac oil – *without making any other changes* – can cut leakage an average of 35%...sometimes 90%!

SUNTAC STOPS SHUTDOWN CAUSED BY OIL LEAKAGE

A manufacturer was having trouble with oil leakage and throw-off from bearings of overhead shafting. This resulted in hazardous conditions and low employee morale. Production had to be shut down frequently. Oil costs were high.

A switch to a Suntac® lubricating oil solved these problems.

If you're losing oil through excessive leakage from rotating or sliding parts, a Suntac oil can cut your consumption an average of 35%. These oils are especially compounded to reduce drip, throw-off, squeeze-out; their greater adhesiveness enables them to cling firmly to the parts...as they lubricate.

Suntac oils can reduce consumption up to 90% when used in hydraulic systems, circulating systems, and in other continuous use applications.

For further information on versatile Suntac oils, see your Sun representative or write SUN OIL COMPANY, Philadelphia 3, Pa., Dept. S-7.

SUNOCO

INDUSTRIAL PRODUCTS DEPARTMENT

SUN OIL COMPANY Philadelphia 3, Pa.

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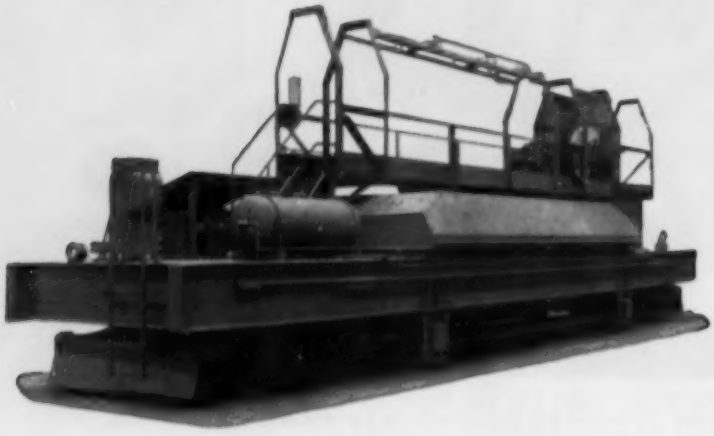
STOCK HOUSE OR HIGH LINE

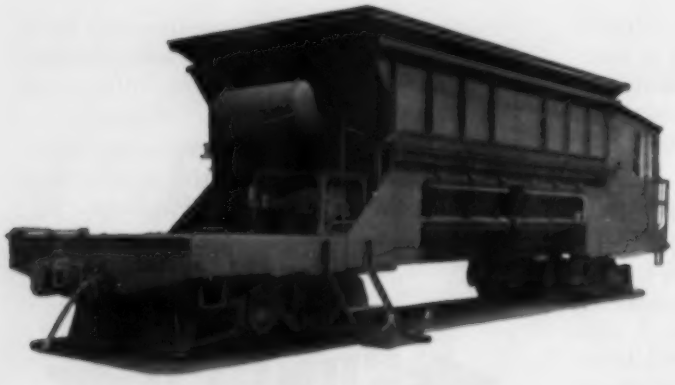
operators prefer the

DEPENDABILITY OF ATLAS CARS

These specially designed units are another example of the ruggedness of Atlas Cars. Their dependability helps maintain the most rigid furnace charging cycles.



40-TON SCALE CAR
Double Hopper Bottom Dump



75-TON ORE TRANSFER
Gable Bottom Double Side Dump

THE ATLAS CAR & MFG. CO.

ENGINEERS MANUFACTURERS
1140 IVANHOE RD. CLEVELAND 10, OHIO, U. S. A.

LETTERS
TO THE EDITORS

Article Is Strong Challenge

The fifth article in your 1956 Program for Management, "Metalworking's New Horizons" (June 18, page 137), is a strong challenge to anyone's thinking.

I would like to bring this article to the attention of technical men in other divisions who normally would not have occasion to see it. I would appreciate your sending six reprints.

W. H. Steinberg
Sales Manager
Abrasive Wheel Department
Manhattan Rubber Division
Raybestos-Manhattan Inc.
Passaic, N. J.

Ideas To Be Explored

Please send three reprints of the article, "Holes Forged In" (July 2, page 67), the second in your Production Ideas series. It presents some production possibilities that we would like to explore more thoroughly.

L. W. Davis
Manager-Press Forge Division
Harvey Aluminum
Division of Harvey Machine Co. Inc.
Torrance, Calif.

Too Tough a Bronc To Ride?

We compliment you on the article, "Boom in Missiles" (July 9, page 63). It is our experience (particularly in reference to this section of the country) that the possibility of sub-contracting has been grossly overlooked. This story will do much to emphasize these prospects.

Since one of the important functions of this department and the field service offices is to advise potential contractors regarding federal government procurement, we would appreciate ten reprints for distribution to organizations and individual concerns.

Albert B. Kahn
Manager
Cheyenne Field Office
U. S. Department of Commerce
Cheyenne, Wyo.

I would like two copies of this story. I enjoy your magazine and think your articles and views are doing a great service to all fields.

J. H. Hanrahan
Stoddart Aircraft Radio Co. Inc.
Hollywood, Calif.

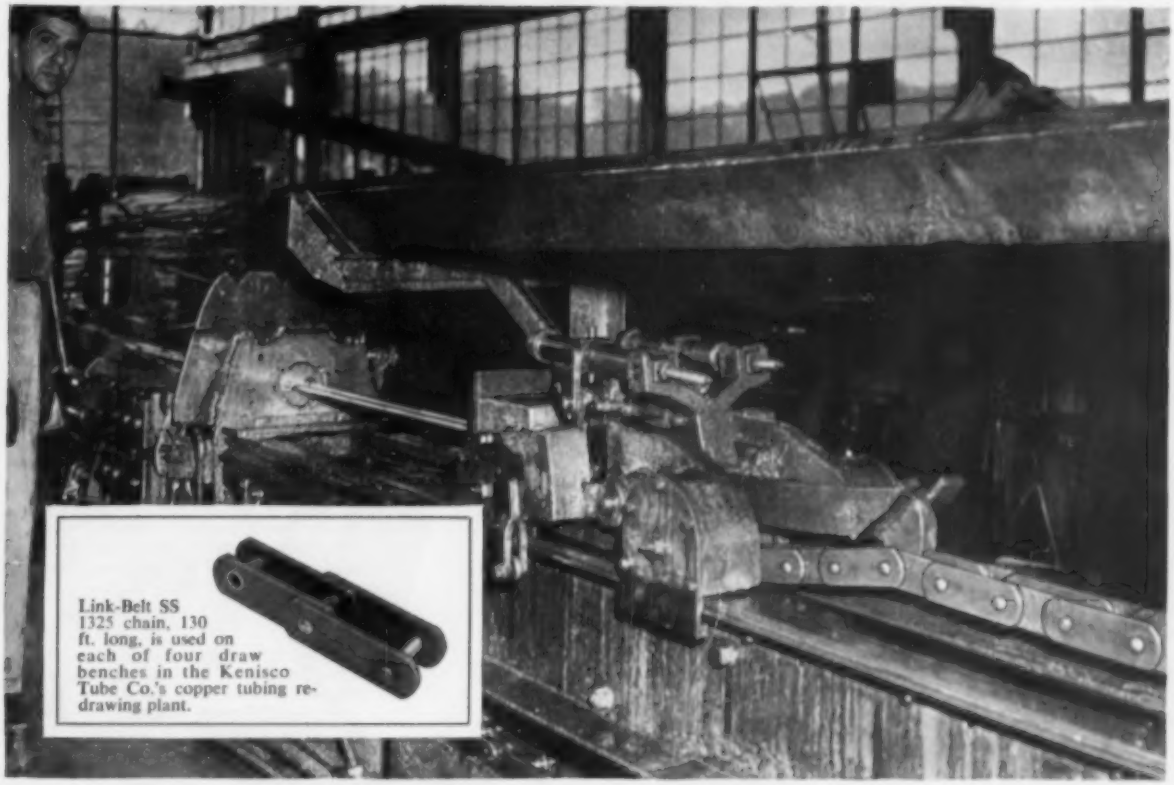
Bouquets to Author, STEEL

In your June 25 issue (page 98), you have an excellent article by Vincent E. Lysaght of American Chain & Cable Co. Inc. The article is entitled "Hardness Testing."

I would like to compliment the author,

(Please turn to page 12)

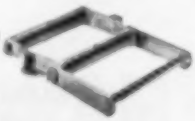
Here's why so many of the nation's draw benches use LINK-BELT chain



Link-Belt SS 1325 chain, 130 ft. long, is used on each of four draw benches in the Kenisco Tube Co.'s copper tubing re-drawing plant.

Looking for the best chain for a specific need? LINK-BELT makes the complete line

Class H drag chain—for drag conveyors, handling shavings or other refuse in runways or troughs.



Class C combination chain—popular, durable, low-cost design for elevators, conveyors.

LXS chain—particularly suitable for heavy-duty drive and conveying jobs.

Transfer chain with tilting dogs—for plate and slab travel, loads up to 300,000 pounds.

LINK-BELT offers the chain that's best for every job

WHETHER it's for a 5000 or a 100,000-pound bench, Link-Belt draw bench chain is built to maintain close pitch and correct sprocket contact. Links are accurately machined after hardening by a special process that assures longer chain life.

Manufacturing refinements such as these are typical of every chain in the complete Link-Belt line. Accurate control of raw materials and manufacturing processes is your assurance of uniformity.

For complete information on chains and sprockets for draw bench or any drive or conveyor service, get in touch with your nearest Link-Belt office or authorized stock-carrying distributor.

LINK-BELT

CHAINS and SPROCKETS

LINK-BELT COMPANY: Executive Offices, Prudential Plaza, Chicago 1. To Serve Industry There are Link-Belt Plants, Sales Offices, Stock Carrying Factory Branch Stores and Distributors in All Principal Cities. Export Office: New York 7; Canada, Scarboro (Toronto 13); Australia, Marrickville, N.S.W.; South Africa, Springs. Representatives Throughout the World. 14.148

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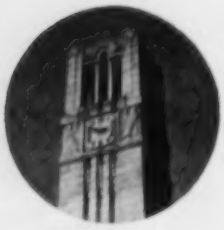


NORTH CAROLINA STATE COLLEGE

Ideas for tomorrow's products — and research leading to improvements in today's products and processes — are among the tangible benefits available to industry in North Carolina.

Three famed educational institutions combine to form a research center that is attracting top scientists and graduating increasing numbers of science and engineering students. Separately and cooperatively, these great schools carry on major projects for industry and government.

North Carolina research equipment and facilities include the first independently-owned, unclassified nuclear reactor. Scientists and research engineers at the universities are available to consult with industry. Trained personnel is provided by increasing numbers of students majoring in the modern sciences.

Here, in this uncrowded area and unhurried atmosphere, already distinguished for its research projects, laboratories are welcomed. More companies are invited, too, to share the present research facilities and other important advantages of plant locations in North Carolina. Write in confidence for additional information.

FREE BROCHURE

"Industrial Location Factors"— Send for a copy today.

Department of
CONSERVATION AND DEVELOPMENT
Raleigh 10, North Carolina
William P. Saunders, Director

NORTH CAROLINA
YEAR 'ROUND MID-SOUTH

LETTERS

(Concluded from page 10)

Mr. Lysaght, and your publication for this excellent article. I would also like to have two copies of this article.

J. P. Disauer
Quality Control Manager
Ashtabula Division
Reliance Electric & Engineering Co.
Ashtabula, Ohio

No Dock Levelers

The article, "Integrated Handling" (May 28, page 106), was well done, but I was surprised that in the section called, "Spotting the Trends," there was no mention of dock levelers.

I've heard some people say that in ten years dock levelers will be as common as lift trucks. Practically all the larger companies are using dock levelers because they are a safer way of loading and unloading, at lower cost and with less man-hours.

I was glad to see your comment on better space utilization. We see this as a definite trend.

Jerome L. Huff
Sales Manager
Hartman Metal Fabricators Inc.
Rochester, N. Y.

Plastic Muffler Experiment

In the Mirrors of Motordom column of June 4 (page 73) is mentioned a possibility of the use of plastic mufflers. Could you please let me know the source of this story and who is experimenting with such a possibility?

Victor Perry
The Public Relations Board
Chicago

• *This information came from a confidential source, but George Gaudaen of the Automobile Manufacturers Association could discuss it with you. The association is located at 320 New Center Bldg., Detroit 2, Mich.*

Impressed by Quality

I am impressed by the quality of your article, "How To Choose the Right Copper" (May 7, page 94). It compiles in a few pages more than I have been able to glean from many magazines and books.

C. B. Rex
Head-Materials Branch
U. S. Naval Underwater Ordnance Station
Newport, R. I.

More Lube Data Wanted

We would appreciate receiving full details on the "High-Temp Lube" mentioned in the Technical Outlook column May 21 (page 109).

R. E. Blue
Chief Engineer
Amplex Oilite Products
Detroit

• *We are sending you some additional data. For further information, write: Bijur Lubricating Corp., Rochelle Park, N. J.*

Interested in Plating Test

We will appreciate receiving more information on the "Plating Test" described in the May 7 Technical Outlook column (page 93), or the address of the maker.

Leo E. Gatzek
Chief Metallurgist
Pacific Division
Bendix Aviation Corp.
North Hollywood, Calif.

• *Write: R. P. Cargille Laboratories Inc., 117 Liberty St., New York 6, N. Y.*

controlled . . . every step of the way!

VANCORAM FERROCHROMIUM

When you specify Vancoram Ferrochromium, you know in advance – and for sure – that every shipment of these high-grade alloys will meet the highest standards of quality and uniformity.

Why? *Because every step in its production is controlled.* Vanadium Corporation mines it – mills it – smelts it!

In addition, Vanadium's Technical Staff works constantly to improve product quality and help customers in the proper application of Vancoram products to their processes.

Remember, too – there's a type and grade of Vancoram ferrochromium for every application – stainless, tool and constructional alloy steels, and for use in the iron foundry industry.

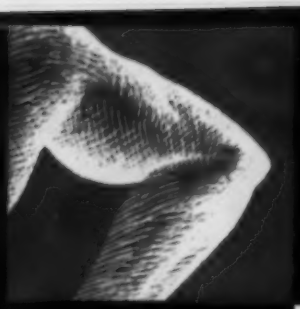
For prompt service, just call your nearest Vanadium Corporation office.

There's always that extra margin of quality in products which carry the Vancoram label.

VANADIUM CORPORATION OF AMERICA

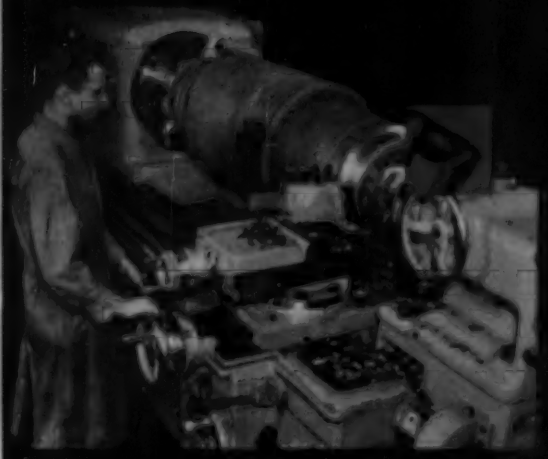
420 Lexington Avenue, New York 17, N. Y. • *Pittsburgh* • *Chicago* • *Detroit* • *Cleveland*

Producers of alloys, metals and chemicals



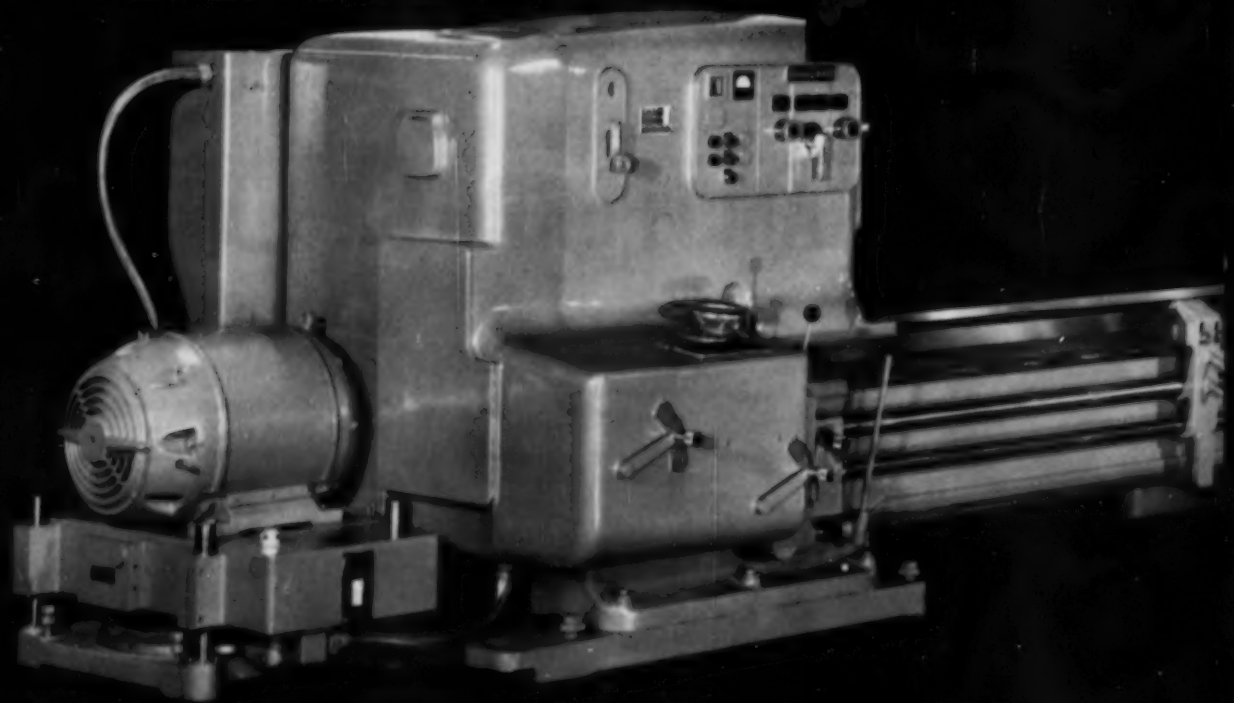
BRAWN

BRAINS



The MONARCH SERIES 90 DYNA-SHIFT HEAVY-DUTY LATHE – Model 2500: Clearance diameter —40" . . . Swing over cross slide 25". **Model 2501:** Clearance diameter—44" . . . Swing over cross slide 31". **Model 2502:** Clearance diameter—48" . . . Swing over cross slide 36".

When progressing from diameter to diameter, speed is changed in *a few* seconds with the flick of *one* dial. The *machine* calculates each speed and changes speed automatically. And the wide available range assures selection of the *right* speed for the diameter to be turned.



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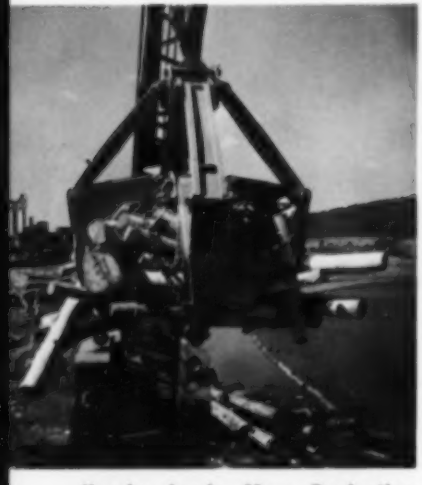
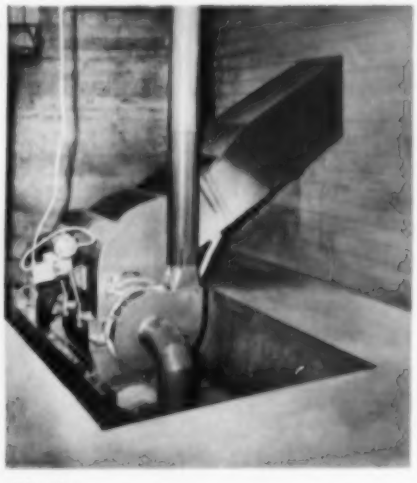
HOW USS "T-1" STEEL IMPROVES THESE PRODUCTS...

Lower-Cost Dirt. This mammoth coal stripping machine scoops out 2000 cu. yds. of overburden an hour, cuts the cost of stripping coal that lies under 50 to 80 ft. of overburden. Its 22-ft. wheel carries eight buckets, each 4 ft. wide, with lips of 2½-inch USS "T-1" Steel. USS "T-1" Steel has the strength and toughness to scrape through shale, rock, mud, and ram into ton-and-a-half boulders day in and day out. In addition, it is weldable in the field, costs less than other steels that could be used—and outlasts them. This wheel excavator was designed by United Electric Coal Companies, Chicago, for their own use.



Heavier Loads, More Production. Mack Welding Company, Duluth, Minnesota, has used USS "T-1" Steel to increase the durability and at the same time reduce the weight of its Orange Peel Type, Four Tine Pulpwood Grapples. With these new, lightweight grapples, crane operators can handle increased payloads with present cranes. As a result, production can be increased as much as 40 percent.



Shucks, hay fodder, corn cobs, and grains are extremely abrasive when sucked out of a hammermill at high speed. And the blades of the fan that does the sucking must be able to withstand the abrasion and must be weldable. Myers-Sherman Company, Streator, Illinois, manufacturers of industrial hammermills, now make these fan blades from USS "T-1" Steel and save $7 on fabrication of each fan. USS "T-1" Steel provides all the needed durability, as well as good weldability.

Moloney Saves A Ton. The size of everything had to be reduced on this new, smaller-than-ever portable transformer designed by Moloney Electric Company, St. Louis, Missouri. Over a ton of weight was saved in the tank alone by building it of ¼-inch USS "T-1" Steel instead of ⅝-inch carbon steel. The very high strength of this heat-treated alloy steel made possible this 25% saving in weight. The excellent weldability of USS "T-1" Steel was important, too, because this portable transformer is permanently welded to the bed of a semi-trailer. This particular unit was designed for Oklahoma Gas & Electric Corporation. Shell was fabricated by Nooter Corporation, St. Louis.

HOW IT CAN HELP YOU

USS "T-1" Steel, with its high minimum yield strength of 90,000 psi and its minimum tensile strength of 105,000 psi, can help you design or build lighter-weight equipment that will last longer. Its unusual toughness can help you design or build equipment capable of taking severe impact and abuse at sub-zero temperatures. Its excellent weldability can help you cut the cost of fabricating high strength parts, and to reduce repairs and maintenance expense.

Somewhere in your operation, versatile USS "T-1" Steel can help you. Write, wire, or phone United States Steel, Room 5397, Pittsburgh 30, Pa.

UNITED STATES STEEL CORPORATION, PITTSBURGH • COLUMBIA-GENEVA STEEL DIVISION, SAN FRANCISCO • TENNESSEE COAL & IRON DIVISION, FAIRFIELD, ALA.

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See The United States Steel Hour. It's a full-hour TV program presented every other week by United States Steel. Consult your local newspaper for time and station.

UNITED STATES STEEL

"This forging lost 33 tons along

says **Joseph Lacey,**
Supt. of Machine Shops
USS Homestead
Forgings Division

It was during the First World War, 38 years ago, that Joseph Lacey first toted his lunchbox as an apprentice machinist for United States Steel. He is now master of industrial machining, and has been entrusted with a large crew of machinists, inspectors and other experts who make USS Quality Forgings.

Visitors are always intrigued by the great difference between the ingot weight and the shipped weight of the forging. The picture, for example, shows a power station turbine rotor, one of our specialties. Forgings of this type have as much as 65% metal loss from ingot to shipped weight. Where and why did it go?

The nature of open die press forging on large ingots is such that considerable stock must be left on the various diameters of a contour forging. Top and bottom "crop" losses at the press, depending on various metallurgical factors such as ingot size and design, account for a considerable percentage of metal loss. However, other than "crop" losses, the open die press cannot remove large amounts of metal—this must be done in the machine shop.

When the forging arrives at the machine shop, special carbide tooling permits large amounts of steel to be "hogged off" through the use of high speeds and feeds and heavy cuts. This is known in the forging business as rough machining—fast removal of large amounts of metal. Rough machining is often accomplished in two stages—before and after heat treatment for physical properties. When specified, large masses of metal are removed in the preliminary rough machining operation known as "barking." After heat treatment, the machinist must "final rough machine" with sufficient stock allowance to permit the customer to finish the job to size in his machine shop.

So you can't skimp on steel if you want a superlative job—like a USS Quality Forging. A liberal, non-penny-pinching approach is needed, and that's what you get from United States Steel. Why not write for a free copy of our 32-page booklet that describes USS Quality Forgings? Address inquiries and booklet requests to United States Steel, Room 5397, 525 William Penn Place, Pittsburgh 30, Pa.

USS QUALITY FORGINGS

heavy machinery parts . . . carbon, alloy, stainless
forged steel rolls and back-up roll sleeves
electrical and water wheel shafts
specialty forgings of all types

UNITED STATES STEEL

BLAST FURNACE downcomer linings being gun-applied with Lumnite-concrete at Pittsburgh Works, Jones & Laughlin Steel Corp. Inset (left) shows blast furnace downcomer system lined with Lumnite Industrial Concrete.

Protect downcomer systems with Industrial Concrete linings

Abrasion and heat put Lumnite-concrete linings to the test in these big blast furnace downcomers. But once "shot" into place, Lumnite* gives long-lasting, smooth, jointless linings that effectively withstand rugged service conditions. If repairs are needed, they can be made quickly and easily—because Lumnite-concrete reaches service strength within 24 hours.

Such linings are just one of the many profitable uses for Lumnite calcium-aluminate cement in blast furnaces. Use it also for **Heat-Resistant** foundation pads in blast furnaces and stoves; **Refractory** linings in hot blast mains, where the easy placement of Lumnite-concrete simplifies the once intricate job of forming Y-intersections; Refractory Concrete **insulation** for stove domes; and for many other jobs where high-temperature service up to 2600°F. and durability are needed.

Keep a supply of Lumnite cement or prepared Lumnite-base castables on hand for emergency needs. Packaged castables containing Lumnite cement and selected aggregates assure the right concretes for a wide variety of high-temperature applications. Castables are made and distributed by leading manufacturers of refractories.

UNIVERSAL ATLAS CEMENT COMPANY

UNITED STATES STEEL CORPORATION SUBSIDIARY

100 PARK AVENUE, NEW YORK 17, N. Y.

*"LUMNITE" is the registered trademark of the calcium-aluminate cement manufactured by Universal Atlas Cement Company.

L-128

Atlas® Lumnite Cement

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JOB DEMONSTRATIONS to *prove* how your operations can be made more efficient with the new hydraulic developments.

REGIONAL FACTORY SERVICE includes *complete maintenance facilities* for building, testing, repairing equipment.

OVER-THE-COUNTER SALES from local stock to give you *immediate delivery* of hydraulic pumps, motors and controls.

Behind the name Denison... With its regional warehouses and branch offices, Denison's factory service is now as near as your telephone. Specialists in hydraulics are immediately available to help you build a better product, build it for lower cost.

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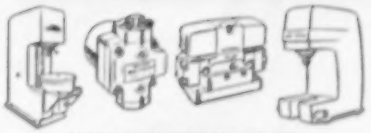
A Subsidiary of American Brake Shoe Co.

DENISON HydrOILics



HYDRAULIC PRESSES • PUMPS
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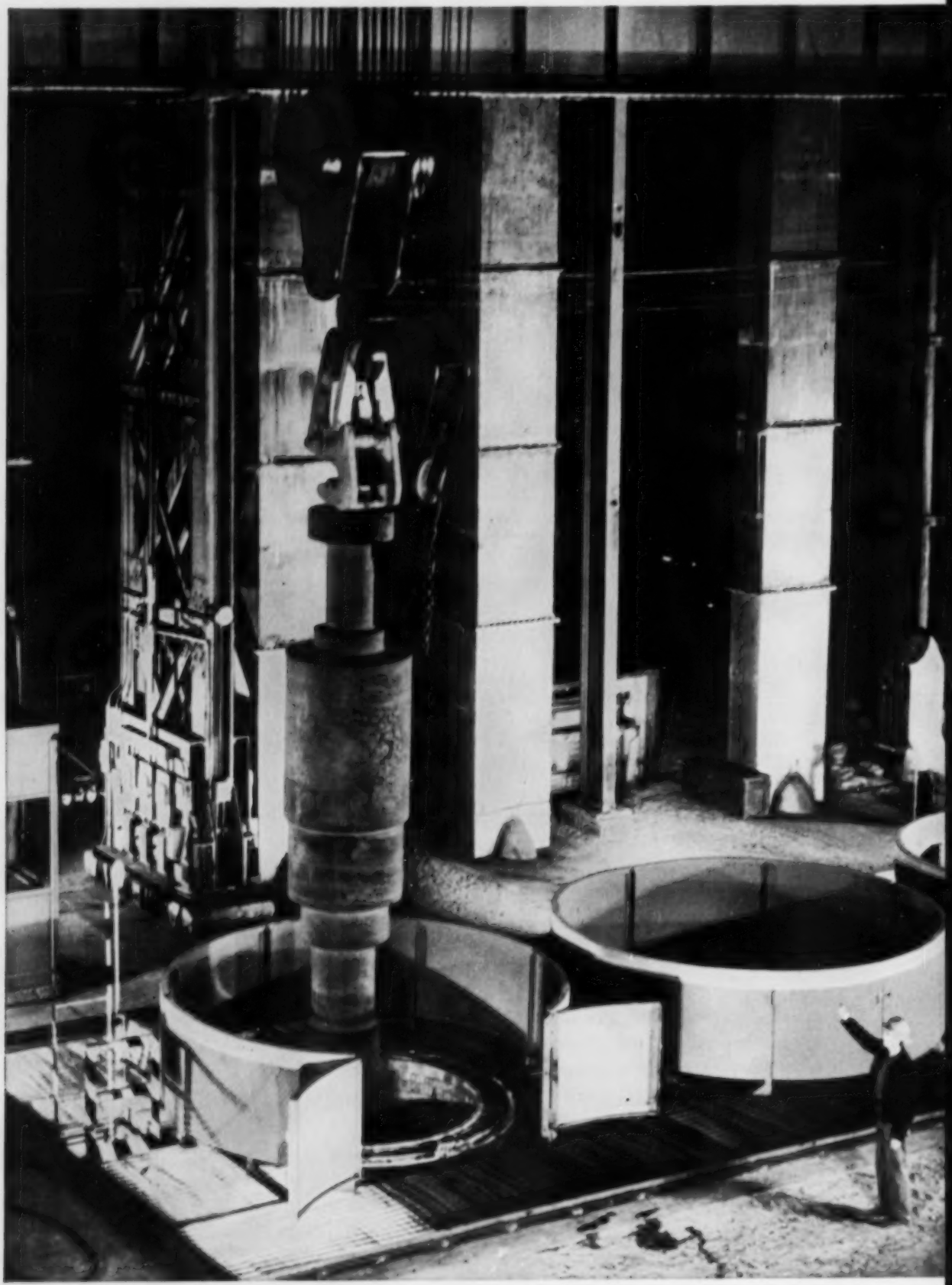


Giants, too, heated without distortion

Westinghouse pressurized furnaces keep 30-ft forgings "straight as an arrow" at U. S. Steel

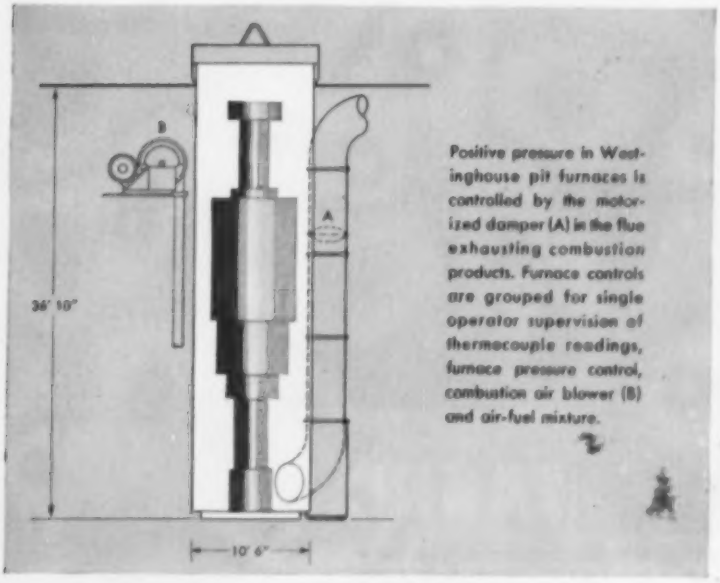
Three large, Westinghouse pit-type furnaces at U. S. Steel's Homestead Works are built to pamper giant forgings. This turbine rotor, for example, lifts out straight and true at 1830°F. During eight hours of soaking heat the temperature along its 30-foot length never varied as much as 10°F. Distortion was never a problem because of Westinghouse temperature control and positive pressure furnace design.

In this design even heating is assured through back pressure control of combustion gases. With positive pressure in the furnace any air leakage is always outward. Thus localized chilling of the work is prevented. The furnace is tangentially fired by means of spirally located burners and is equipped with 3 zones of automatic temperature control. Since the products of combustion are sucked out from the bottom of the furnace, heat currents make two passes the full length of the work...once upward, once downward.

In Westinghouse experience with gas, electric, or induction heating equipment, we have undoubtedly solved a problem like yours. You can be sure of our broad experience by calling your local Westinghouse industrial heating engineer today or write Westinghouse Electric Corporation, Industrial Heating Division, Meadville, Pa. J-10451

WATCH WESTINGHOUSE!

WHERE BIG THINGS ARE HAPPENING TODAY!



Positive pressure in Westinghouse pit furnaces is controlled by the motorized damper (A) in the flue exhausting combustion products. Furnace controls are grouped for single operator supervision of thermocouple readings, furnace pressure control, combustion air blower (B) and air-fuel mixture.

W. E. Collar reports . . .*

Facts to lick your distortion problem

Unusual facilities and experience at Westinghouse have enabled us to jump years of trial-and-error methods in engineering furnaces and induction heating equipment to prevent distortion. We're constantly after better ways to gain temperature uniformity in metal processing equipment. This is necessary not only to prevent distortion but also to obtain desired metallurgical properties.

On special problems, our equipment design engineers have the advantage of facts gained through Westinghouse metallurgical research activities. Production testing of equipment design and engineering is carried out by our Materials Manufacturing Division at Blairsville, Penna. These activities back up our long experience in gaining accurate heat distribution for positive temperature uniformity.

The results can be seen in a Westinghouse furnace used for the air tempering of rotors for atomic equipment. Accurate heat control designed into this electrically heated furnace meets demanding requirements for distortion-free work.

Another case in point is the work on distortion problems under way in our induction heating laboratory. Here equipment is being developed for distortionless hardening of automotive axles.

The teamwork that solved these application problems is your assurance of getting the latest in engineering development and the finest equipment for all your metal processing needs.

**Manager, Industrial Heating Dept.*

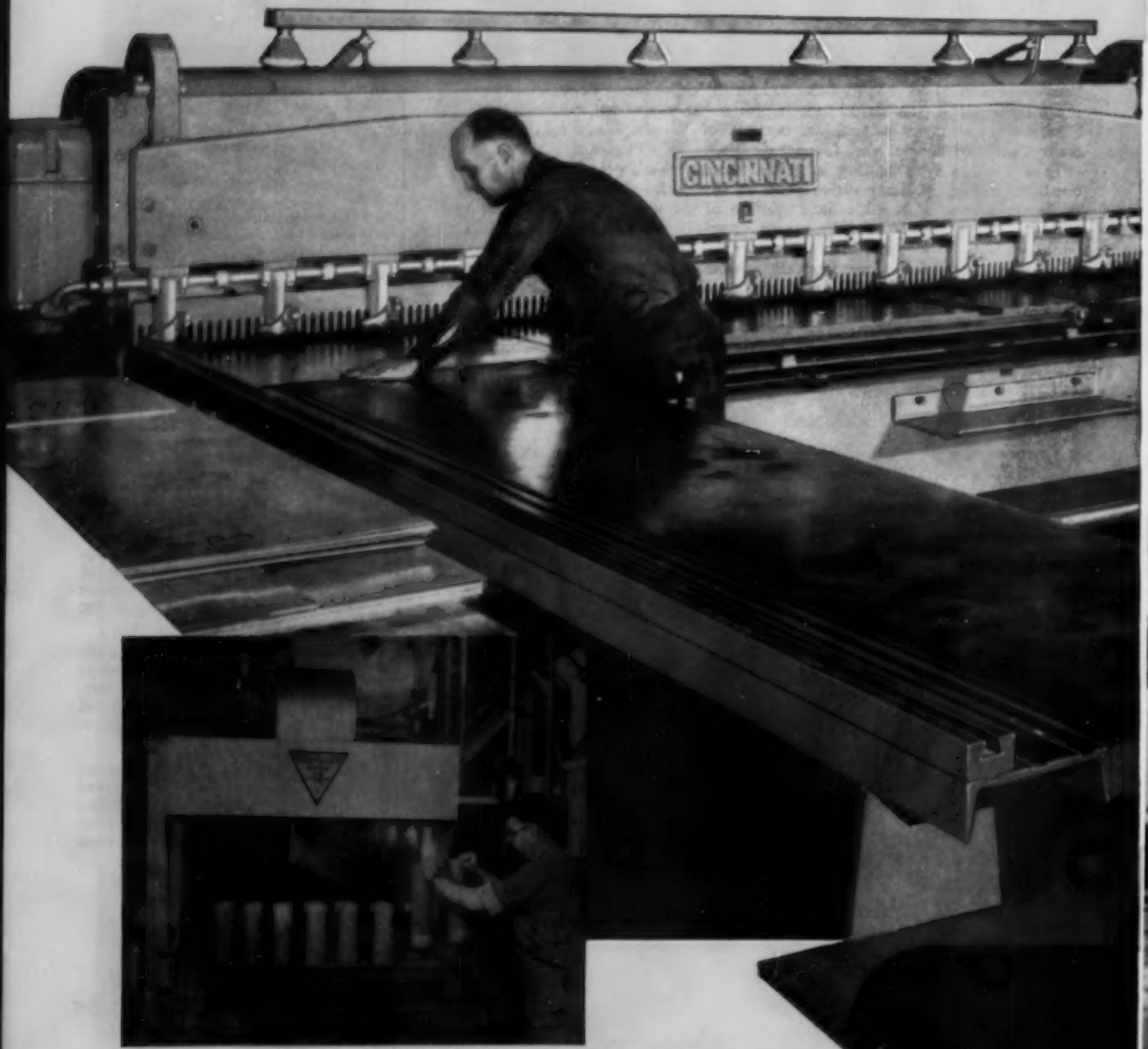
The Westinghouse Heat-Treating Family

GAS • ELECTRIC • INDUCTION

Cincinnati Shear's

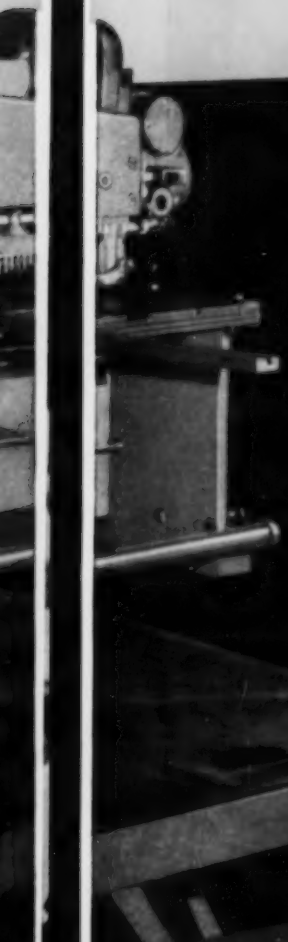
and ACCURATE

Photos courtesy Despatch Oven Company, Minneapolis, Minnesota.



New front controlled power back gauges are now standard equipment on ALL CINCINNATI SHEARS.

fast, easy gauge setting... *SAVES TIME!*



Cincinnati features bring speed and accuracy in turning out panels for industrial ovens at the Despatch Oven Company.

5′ x 10′ sheets are trimmed four sides—corners are square, sides are clean and straight and panels are sheared accurately to size.

Cincinnati quick, convenient and positive gauging, accurate knife alignment and powerful hydraulic hold-downs speed performance.

Despatch Oven Company say—"This shear has brought an operating time saving, reduced time for maintenance. Performance very good."

Write for Shear Catalog S-7.
If you shear we can help you.

THE CINCINNATI SHAPER CO.

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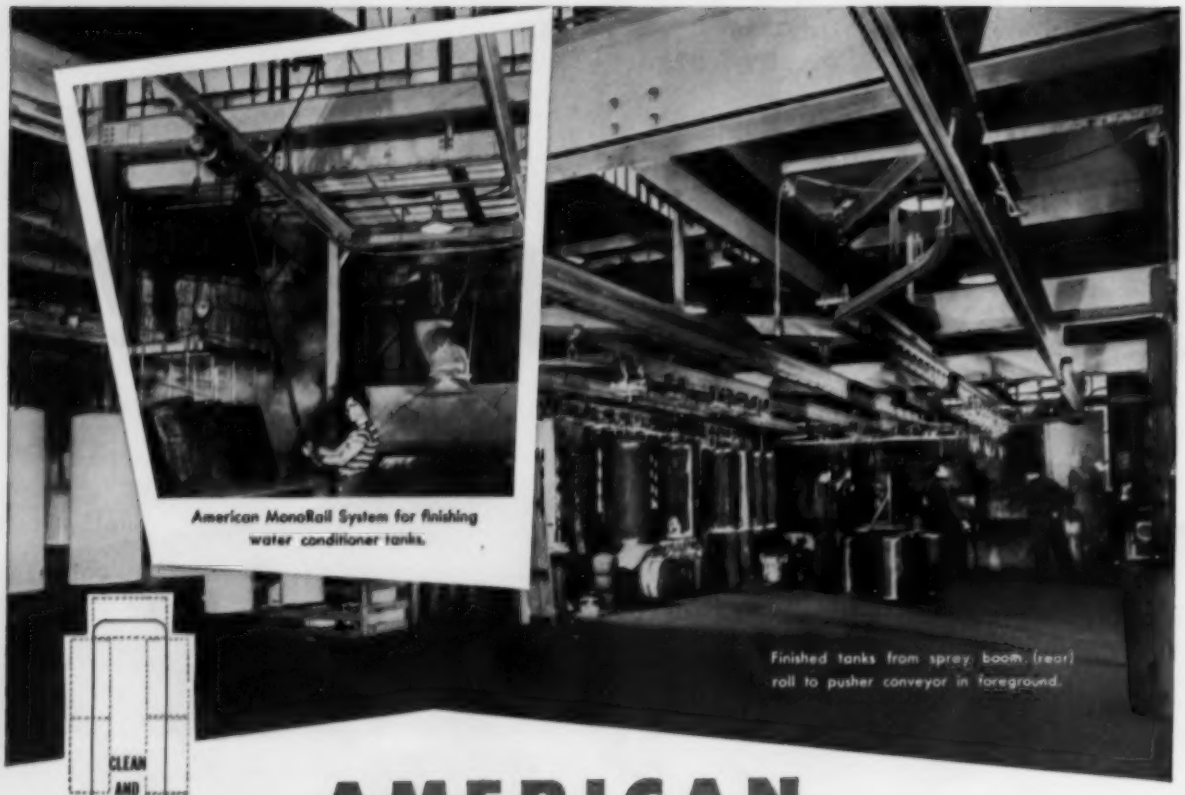
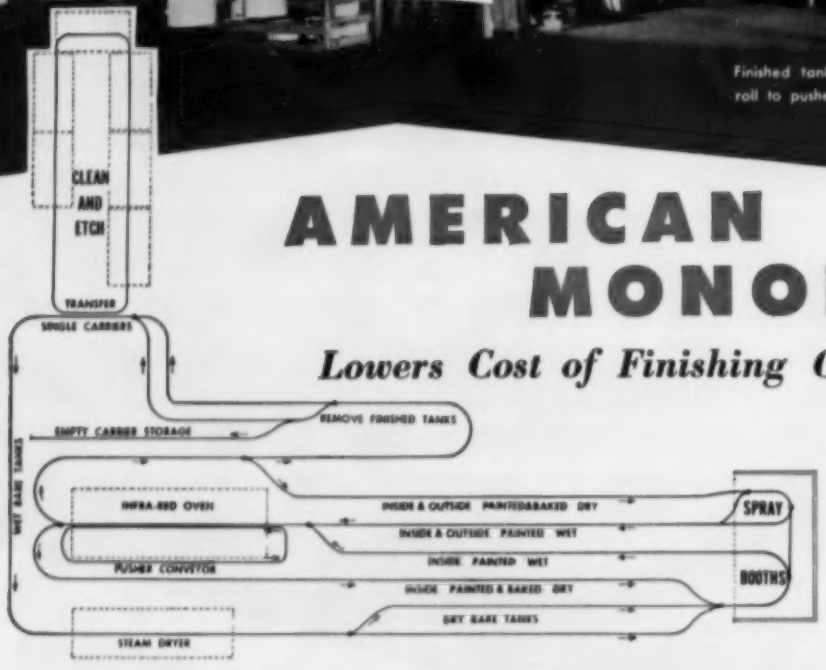


American MonoRail System for finishing water conditioner tanks.

Finished tanks from spray booth (rear) roll to pusher conveyor in foreground.

AMERICAN MONORAIL

Lowers Cost of Finishing Operation



Costs are cut every step from cleaning and etching to finished tanks in this continuous operation by American MonoRail. For this manufacturer the up-and-over system of materials handling boosted production, improved space utilization, cut damages to material and improved both working conditions and production control.

If you have a materials handling problem, call your nearby American MonoRail engineer. He is qualified to help you solve it.

up and over

"Up-and-Over" is the title of our 16-mm. sound film to solve many tough handling problems at low cost. Please allow three weeks to schedule showing.

AMERICAN OVERHEAD HANDLING EQUIPMENT

MONORAIL COMPANY

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Member of Materials Handling Institute - MonoRail Association

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OF MEETINGS

Aug. 6-8, Society of Automotive Engineers Inc.: National west coast meeting, Mark Hopkins hotel, San Francisco. Society's address: 29 W. 39th St., New York 18, N. Y. Secretary: John A. C. Warner.

Aug. 7-8, National Screw Machine Products Association: National sales conference, Wade Park Manor hotel, Cleveland. Association's address: 2860 E. 130th St., Cleveland 20, O. Executive vice president: Orrin B. Werntz.

Aug. 21-24, Western Electronic Show and Convention: Pan Pacific Auditorium and Ambassador hotel, Los Angeles. Information: Wescon, 344 N. LaBrea Ave., Los Angeles 36, Calif.

Sept. 7-9, Metal Powder Association: Fall meeting, Homestead, Hot Springs, Va. Association's address: 420 Lexington Ave., New York 17, N. Y. Secretary: Robert L. Ziegfeld.

Sept. 9-12, American Institute of Chemical Engineers: Fall meeting, William Penn hotel, Pittsburgh. Institute's address: 120 E. 41st St., New York 17, N. Y. Secretary: F. J. Van Antwerpen.

Sept. 9-12, National Metal Trades Association: Eastern plant management conference, Essex-Sussex hotel, Spring Lake, N. J. Association's address: 122 S. Michigan Ave., Chicago 3, Ill. Secretary: Charles L. Blatchford.

Sept. 10-13, Allied Railway Supply Association: Annual meeting, Sherman hotel, Chicago. Association's address: 1200 W. Chase Ave., Chicago 26, Ill. Executive secretary: Charles F. Well.

Sept. 10-12, Packaging Institute: Annual forum, Hotel Statler, Cleveland. Institute's address: 343 Madison Ave., New York 17, N. Y. Executive director: Charles A. Feld.

Sept. 10-13, Society of Automotive Engineers Inc.: National tractor meeting and production forum, Hotel Schroeder, Milwaukee. Society's address: 29 W. 39th St., New York 18, N. Y. Secretary: John A. C. Warner.

Sept. 11-13, American Die Casting Institute: Annual meeting, Edgewater Beach hotel, Chicago. Institute's address: 366 Madison Ave., New York 17, N. Y. Secretary: David Lamb.

Sept. 11-14, Packaging Machinery Manufacturers Institute: Packaging machinery and materials exposition, Public Auditorium, Cleveland. Information: Hanson & Shea Inc., One Gateway Center, Pittsburgh 22, Pa.

Sept. 12-14, Porcelain Enamel Institute: Annual meeting, Broadmoor hotel, Colorado Springs, Colo. Institute's address: 1145 19th St. N. W., Washington 6, D. C. Secretary: John C. Oliver.

Sept. 16-20, American Society of Sanitary Engineering: Annual meeting, Morrison hotel, Chicago. Society's address: 4716 Ewing Ave. S., Minneapolis. Secretary: Walter A. Dunn.

Sept. 16-21, American Chemical Society: Annual meeting, Convention Hall, Atlantic City, N. J. Society's address: 1155 16th St. N. W., Washington 6, D. C. Executive secretary: Alden H. Emery.

Sept. 17-21, American Society for Testing Materials: Pacific area national meeting and apparatus exhibit, Hotel Statler, Los Angeles. Society's address: 1916 Race St., Philadelphia 3, Pa. Executive secretary: Robert J. Painter.

Sept. 17-21, Instrument Society of America: Annual instrument-automation conference and exhibit, Coliseum, New York. Society's address: 1319 Allegheny Ave., Pittsburgh 33, Pa. Executive director: William H. Kushnick.

Sept. 20-21, American Hot Dip Galvanizers Association: Semiannual meeting, Greenbrier, White Sulphur Springs, W. Va. Association's address: 1806 First National Bank Bldg., Pittsburgh 22, Pa. Secretary: Stuart J. Swensson.

℞ for casting headaches*

Finding the proper castings often causes headaches for the purchasing, production and design men. Many have found the remedy in HAMILTON QUALITY CASTINGS.®

There are differences between foundries, and the differences can be important to you. Hamilton Foundry excels in the problem jobs . . . in castings that are hard to make because of intricate coring, thin metal sections, tight dimensional tolerances or high physical specifications. We take these jobs and consistently "make them right" . . . on time.

Our specialties are light and medium castings in Gray Iron, Alloyed Iron, Meehanite, Ni-Resist and Ni-Hard.

Why not let us relieve your casting headaches?

A 'phone call or letter will bring prompt assistance. Better still, send us the drawing with casting weight and a description of the pattern equipment. We'll be glad to prescribe for that "casting headache"

P.S. The above "headache casting", a pump body, was made in Meehanite; casting weight 3.87 lbs. Cored passages and sections ranging from 11/32" to 2 1/16" made this casting a tough one.

GRAY IRON · ALLOYED IRON
MEEHANITE · NI-RESIST · NI-HARD

THE HAMILTON FOUNDRY
AND MACHINE CO.
1551 Lincoln Avenue · Hamilton, Ohio
Phone TWinbrook 5-7491

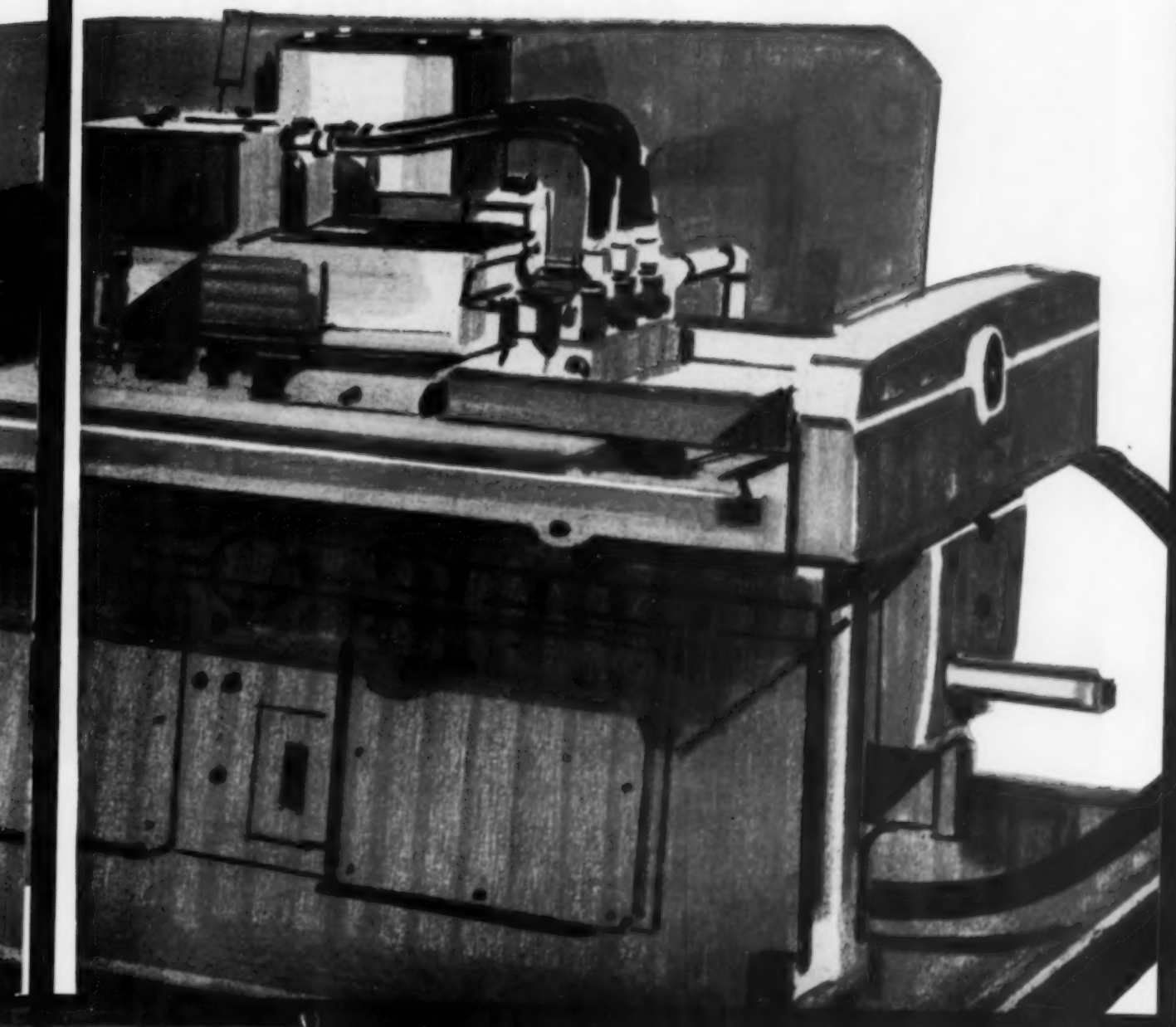
GISHOLT
SIMPL

GISHOLT MASTERLINE SIMPLIMATIC AUTOMATIC LATHE

This is the latest design of the Gisholt MASTERLINE Simplimatic. There are many important improvements and outstanding features. Operation is faster. Setup and change-over are quicker. Maintenance is lower. In short, here is an advanced design for better work at lower cost—and with new minimum requirements for operator skill, attention and effort. Let us tell you more about these improved machines—and how they may be applied profitably to your manufacturing processes.

Gisholt Machine Company, Madison 10, Wisconsin

Look ahead—keep ahead—with Gisholt



REPUBLIC

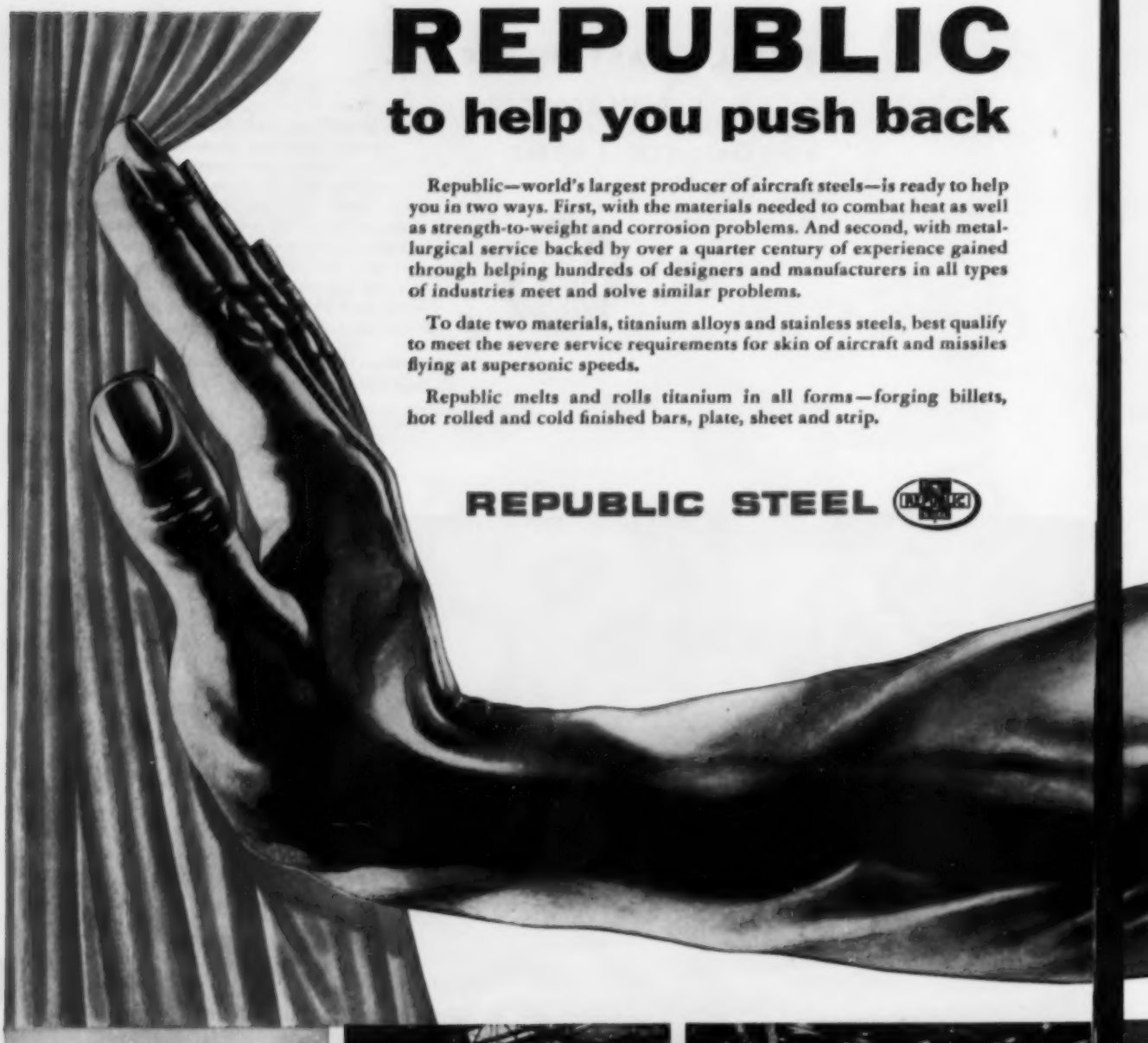
to help you push back

Republic—world's largest producer of aircraft steels—is ready to help you in two ways. First, with the materials needed to combat heat as well as strength-to-weight and corrosion problems. And second, with metallurgical service backed by over a quarter century of experience gained through helping hundreds of designers and manufacturers in all types of industries meet and solve similar problems.

To date two materials, titanium alloys and stainless steels, best qualify to meet the severe service requirements for skin of aircraft and missiles flying at supersonic speeds.

Republic melts and rolls titanium in all forms—forging billets, hot rolled and cold finished bars, plate, sheet and strip.

REPUBLIC STEEL



NEW DEVELOPMENTS create new uses. A unique tank truck with one compartment made of ENDURO Stainless Steel safely handles a corrosive alcohol-water mixture used in turboprop engines. Another compartment, for kerosene, is fabricated from Republic High Strength Steel for extra strength without added weight.

WEIGHT—On the DC-7 superliner, a weight saving, equivalent to one passenger and his luggage, resulted when Titanium replaced other materials normally used in nacelle construction. And with no sacrifice in strength or safety. Titanium offers the highest strength-to-weight ratio of construction metals.

SOLVING HEAT PROBLEMS is old stuff for ENDURO Stainless Steel. ENDURO's ability to withstand heat without loss of strength has been proved on jet engines where it is used for structural and burner components, rings, exhaust systems, afterburners. Now it is being used for skin material to resist high temperatures at supersonic speeds.

STEEL IS READY

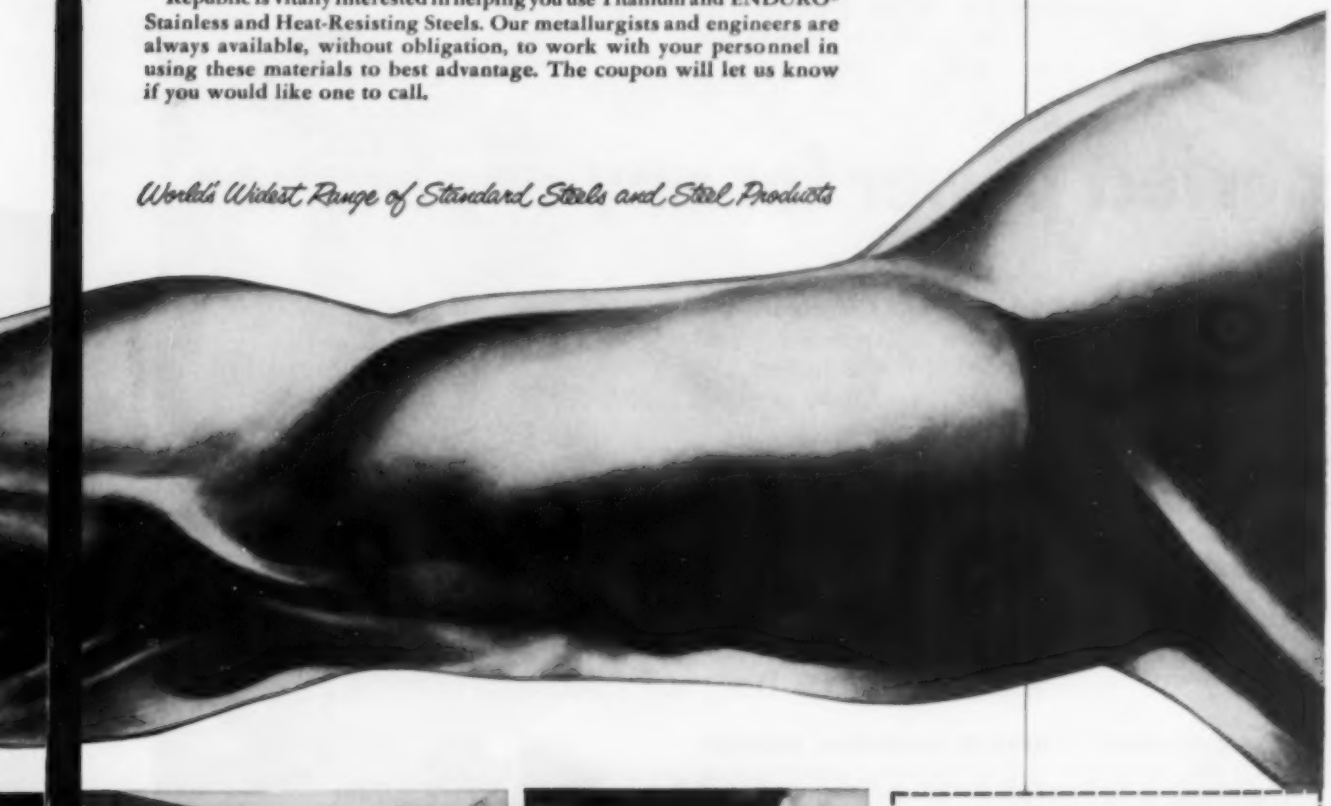
the thermal barrier

Republic is the world's largest producer of alloy, stainless and heat-resisting steels.

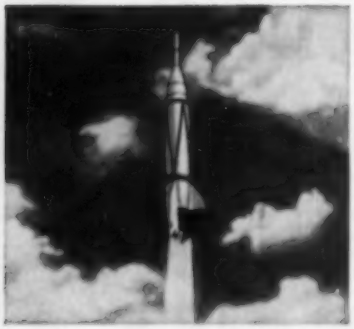
New developments in the fields of supersonic aircraft and missiles increase demand for aircraft quality steels. Republic is keeping pace. New facilities for increasing stainless steel cold rolling and finishing capacity have recently been added. Titanium facilities are being constantly improved and expanded.

Republic is vitally interested in helping you use Titanium and ENDURO® Stainless and Heat-Resisting Steels. Our metallurgists and engineers are always available, without obligation, to work with your personnel in using these materials to best advantage. The coupon will let us know if you would like one to call.

World's Widest Range of Standard Steels and Steel Products



STRENGTH—Landing gear fabricated from Republic Alloy Steels can take the tremendous strain when aircraft hit the runway at high speeds. These fine steels provide the high strength and toughness needed to withstand high impact and heavy loads—provide the hardenability to resist wear at bearing surfaces.



CORROSION-RESISTANCE—Titanium's extremely high corrosion-resistant properties make it attractive for many applications, such as tanks for acids used in combination with missile fuels. Nitric acid has negligible effect on Titanium. It is practically immune to salt water and sea air corrosion.

REPUBLIC STEEL CORPORATION
Dept. C-2244
3120 East 45th Street
Cleveland 27, Ohio

Send more information on these Republic products.

- ☐ ENDURO Stainless Steel
- ☐ High Strength Steel
- ☐ Alloy Steel
- ☐ Titanium
- ☐ Have a metallurgist call.

Name_____ Title_____

Company_____

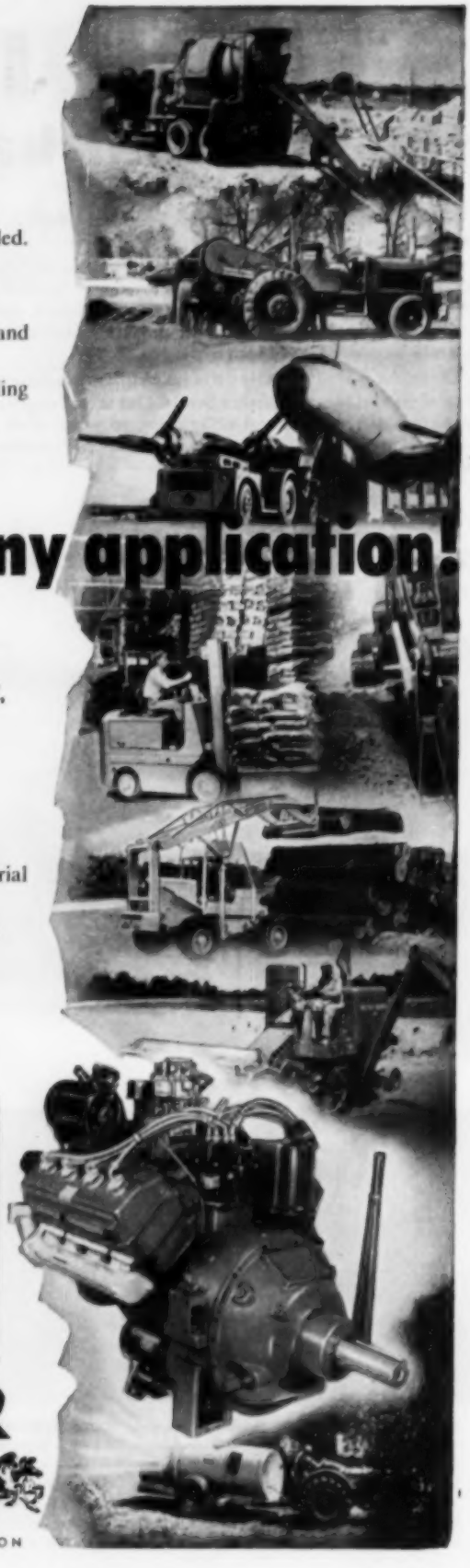
Address_____

City_____ Zone____ State_____

Neither underpowered nor overpowered—
that's because each of these units is equipped with a right-for-the-job Chrysler Industrial Engine.

Power shovels, for example, require a lot of power plus something extra when occasion demands. Chrysler supplies the 331 cubic inch displacement Ind. 56 Engine for regular power requirements plus the dual-cooled Chrysler Industrial Torque Converter for stepped up torque as needed.

Transit mixers, industrial lift trucks and towing tractors may not require as much torque as the shovel; however, they do need protection against the wear and tear of stop and go operation. Chrysler Ind. 30 Engine gives them 230 cubic inch displacement and Chrysler gyrol Fluid Coupling prevents shock loads, engine stalling and lengthens life of engine, drive and equipment.



perfect power for any application!

Ditchers, farm combines, loaders, orchard sprayers — whatever power they need, there's a Chrysler Industrial Engine to supply it. If the unit also requires power takeoff, mechanical or velocity governor, 3, 4 or 5-speed transmission, propane or natural gas burning carburetor, Chrysler can supply these and many other accessories, factory-installed.

Don't let power stall your plans. Check specifications against your requirements. Then see your Chrysler Industrial Engine Dealer — find him in the Yellow Pages of your telephone book under "Engines-Gasoline" — or write direct for catalog: ***Dept. 57, Industrial Engine Division, Chrysler Corporation, Trenton, Michigan.***

SPECIFICATIONS—CHRYSLER INDUSTRIAL ENGINES

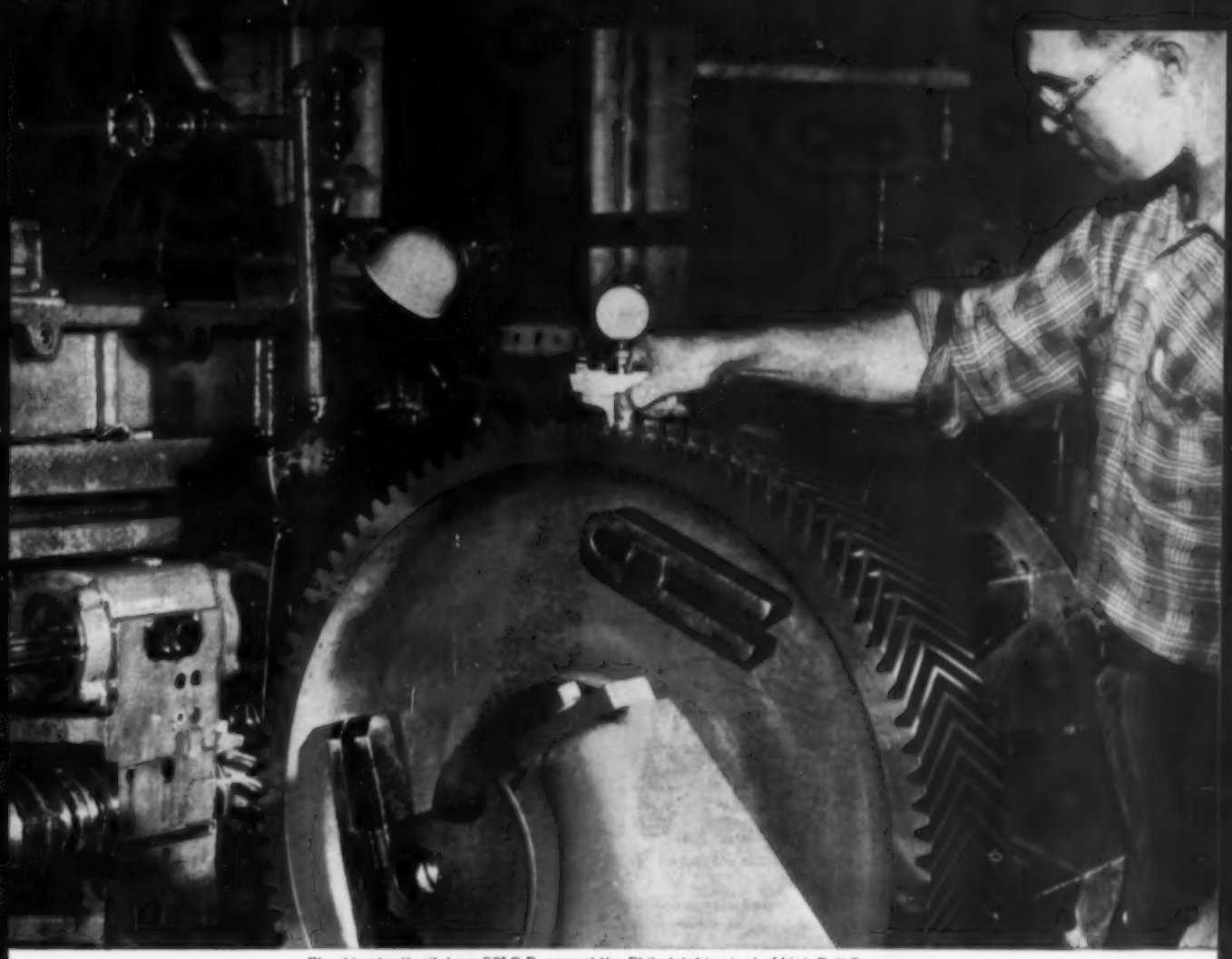
	Ind. 30	Ind. 31	Ind. 32	Ind. 33	Ind. 52	Ind. 56
No. of Cylinders	6	6	6	6	8	8
Type of Engine—4 Cycle	Gasoline	Gasoline	Gasoline	Gasoline	Gasoline	Gasoline
Bore—Inches	3¼	3¼	3⅞	3⅞	3⅞	3⅞
Stroke—Inches	4½	4½	4¼	4¼	3¼	3½
Displacement—Cu. In.	230	230	265	265	270	331.1
Compression Ratio	7.0	7.0	6.8	6.8	7.5	7.5
Valves—Arrangement	L	L	L	L	OHV	OHV
Camshaft Drive	Silent Chain	Gear	Silent Chain	Gear	Silent Chain	Silent Chain
Engine Width*	23⅛"	23⅛"	23⅛"	23⅛"	30⅞"	28¹⁵⁄₁₆"
Engine Length*	32⅞"	31¹⁵⁄₁₆"	32¹⁵⁄₁₆"	33¹⁄₁₆"	29¹⁵⁄₁₆"	31⅛"
Engine Height*	34½"	32³⁄₁₆"	32¹⁵⁄₁₆"	32¹⁵⁄₁₆"	34¼"	34³⁄₁₆"
Engine Weight*	575 lbs. (approx.)	610 lbs. (approx.)	740 lbs. (approx.)	760 lbs. (approx.)	712 lbs. (approx.)	845 lbs. (approx.)

*Dimensions vary with equipment. Specifications subject to change without notice.

CHRYSLER
industrial engines

HORSEPOWER WITH A PEDIGREE

INDUSTRIAL ENGINE DIVISION • CHRYSLER CORPORATION



Checking teeth pitch on 32" O.D. gear at the Philadelphia plant of Link-Belt Company.

speed up machining, extend cutter life with Standard Steel forged gear blanks

By switching to Standard Steel forged blanks for the helical and herringbone gears used in their enclosed drive units, the Philadelphia plant of Link-Belt Company has speeded up machining time and lengthened cutter life substantially. That's because:

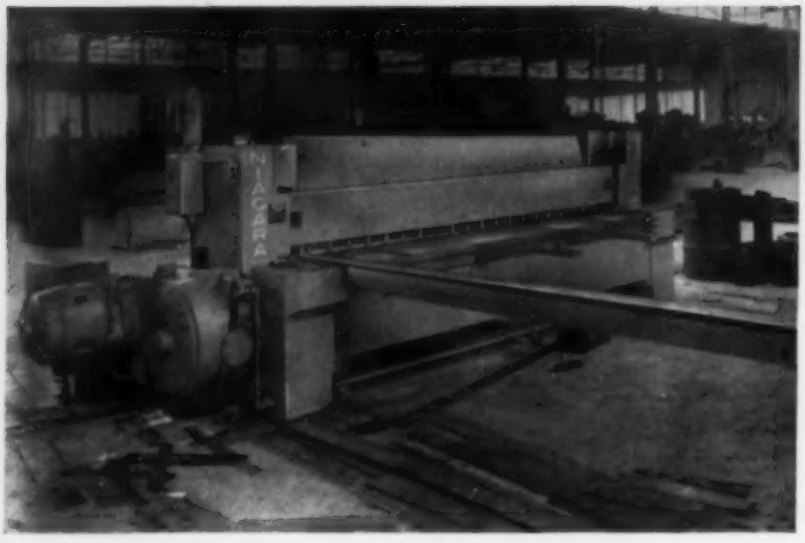
- Dimensional tolerances are closer, so all gear blanks of the same size can be machined on a single setup.
- Standard Steel forged blanks have no blow holes, porosity or non-metallic inclusions, so finish turning, facing, boring and hobbing can be done faster.
- High speed cutters last much longer because these forgings have a more uniform internal structure.

Link-Belt's experience in reducing costs is typical of hundreds of other manufacturers. When you specify Standard Steel forgings, you get a product that is quality-controlled from start to finish. We produce our own acid open hearth steel, heat treating and tempering it carefully. Finished forgings are carefully inspected and checked to assure meeting customer specifications.

In addition to gear blanks, Standard Steel can furnish you with rings, flanges, shafts, wheels and special shapes—and furnish them *fast*. Next time you need forgings, get our quotation first. For a copy of our new bulletin, write us at Dept. 8946, Standard Steel Works Division, BLH Corporation, Burnham, Penna.

STANDARD STEEL WORKS DIVISION
BALDWIN-LIMA-HAMILTON

DIVISIONS: Austin-Western • Eddystone • Lima Electronics & Instrumentation • Hamilton • Pelton • Loewy-Hydropress • Madsen



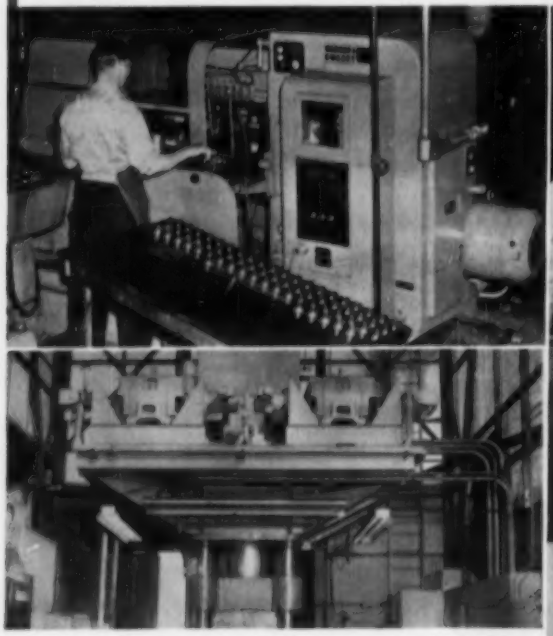
Century Performance-Rated Motor provides heavy duty muscle power for this large shear.

The ability to handle heavy shock load was an important factor in the selection of a Century Motor with proper torque and speed for this application.

Century Performance-Rated® Motors for

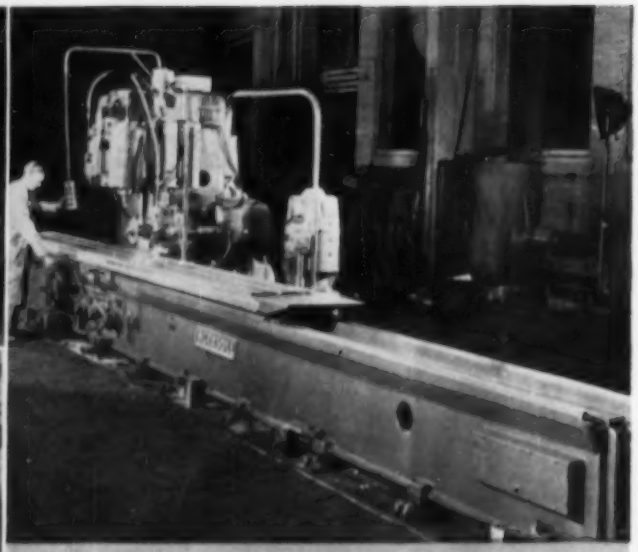
Century Performance-Rated Motor helps get production out fast on 5-spindle automatic chucking machine.

In the selection of a Century Motor, all the factors were Performance-Rated to match the specific application—speed, torques, mounting and frame protection.



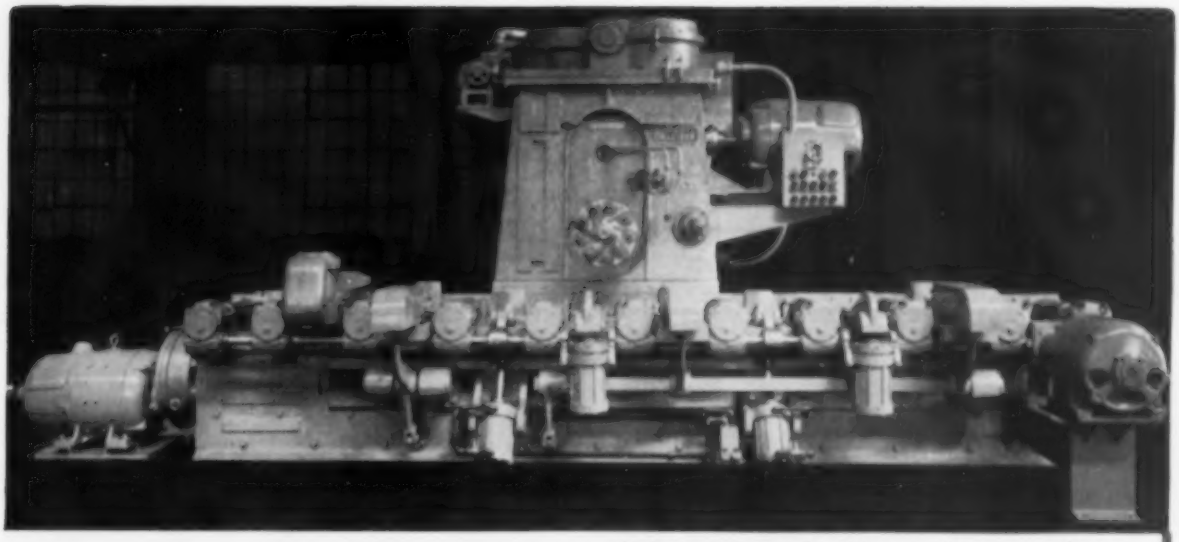
5 Century Performance-Rated Motors help produce 5,000,000 pounds of controlled pressure.

Each of the five 100 H.P. Century Motors possesses the proper torques and speed to help this giant press operate profitably.



5 Century Performance-Rated Motors help bring out the best performance from this 22-ft. keyway slotter.

With each motor engineered for top performance in its own specific job, the 5-motor Century team contributes to cost-saving operation of this important unit.



15 Century Performance-Rated Motors are the power team for fast skinning of high-chrome steel billets.

These *Performance-Rated* Century Motors provide ample power for skinning "52100" high-chrome steel billets at a rate of 2900 sq. in. per hour.

Modern Ideas

IN PRODUCTION MACHINES

Leading designers will tell you that much of the precision and efficiency of modern machine tools depends on motors properly "fitted" to the job. In many cases, these are Century Motors. Because they are Performance-Rated, Century Motors provide an unequalled wide range of speed, torque, mounting and frame characteristics. When properly selected, they bring out the best performance in any machine.

Get full value from your investment in new equipment . . . specify Century Motors! For Performance-Rated replacement motors, call your nearby Century authorized distributor or contact our District Sales Office.

Performance-Rated© MOTORS 1/8 to 400 H. P.

CENTURY ELECTRIC COMPANY

1806 Pine Street • St. Louis 3, Missouri • *Offices and Stock Points in Principal Cities*

A New Line of Gas Fired Homocarb Furnaces

***Here for the first time** is gas-fired equipment that gives you all the industry-proved advantages of the Homocarb® method with Microcarb® Atmosphere Control:*

Uniform product quality • High production rate • Low operating cost

You get completely "packaged" equipment which includes Microcarb Atmosphere Control, a Safe-Start Burner Control Unit and the Homocarb furnace.

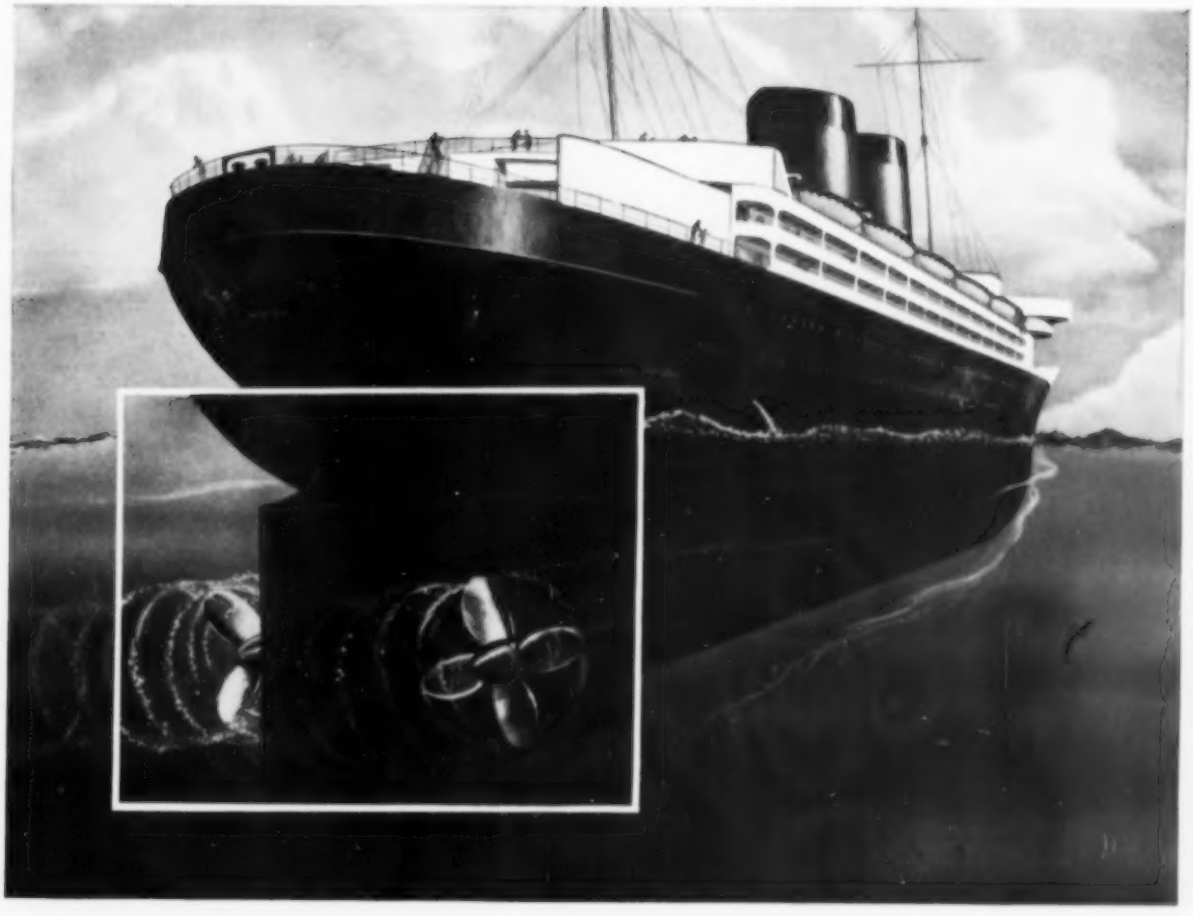
1 Microcarb Atmosphere Control gives continuous, automatic regulation of carburizing atmosphere during the entire heat treating cycle.

2 The Safe-Start Burner Control Unit is a "packaged" combustion control assembly with all operating and safety components mounted, wired and piped before shipment.

3 The Gas-Fired Homocarb furnace combines all the advantages of the Homocarb method . . . uniform carburizing, high production, operating economy . . . in a gas-fired furnace.

For complete information just write us at 4957 Stenton Ave., Philadelphia 44, Penna.

LEEDS NORTHRUP
instruments *automatic controls • furnaces*



What a ship can show you about COPPER

Ocean-going vessels put any metal to the test.

Salt water under the hull, salt air over the superstructure . . . these tend to "eat away" metals less corrosion-resistant than copper.

The British Admiralty found, in 1870, that adding *tin* to "cartridge brass" greatly increased its resistance to corrosion at sea. Hence the alloy known today as "Admiralty Metal." Since those days, many other copper alloys have been developed with even greater resistance to corrosion.

Now, your Company may never wish to build a huge ship's propeller or a vast rudder or a steersman's wheel or even a navigator's sextant.

But if you make *any* product that can be improved by adding to its durability and resistance to corrosion, copper is for you.

Whether your product goes to sea or serves ashore, the *workability* of copper's many alloys is another advantage to you. They join readily . . . are easy to form . . . plate and polish beautifully . . .

. . . and they *stand up in service* wherever you put them to work . . . on board or on shore!

COPPER & BRASS
RESEARCH ASSOCIATION

420 Lexington Avenue, New York 17, N. Y.

. . . AN INDUSTRY SOURCE OF TECHNOLOGICAL AID, INCLUDING A LIBRARY OF TECHNICAL LITERATURE AND A COUNCIL OF SPECIALISTS

COPPER OR ITS ALLOYS PROVIDE THESE ADVANTAGES:

Best conductor of electricity commercially available

Does not rust . . . high corrosion resistance

Best heat transfer agent of all commercial metals

Easy to machine, form, draw, stamp, polish, plate, etc.

Welds readily . . . excellent for solder.ng and brazing

FREYN DESIGN®
Blast Furnace–
The World's Largest!

Great Lakes Steel Corporation of Detroit, Michigan, a division of National Steel Corporation, operates this mammoth iron-maker. It was blown in during June, 1955, and is still the world's largest blast furnace.

The Freyn Department of Koppers Engineering and Construction Division designed and erected this giant. It has a hearth diameter of 30 feet, 3 inches, and a total interior volume of 64,435 cubic feet. Soaring 260 feet above yard level, this blast furnace weighs, when fully charged, about 12,800 tons.

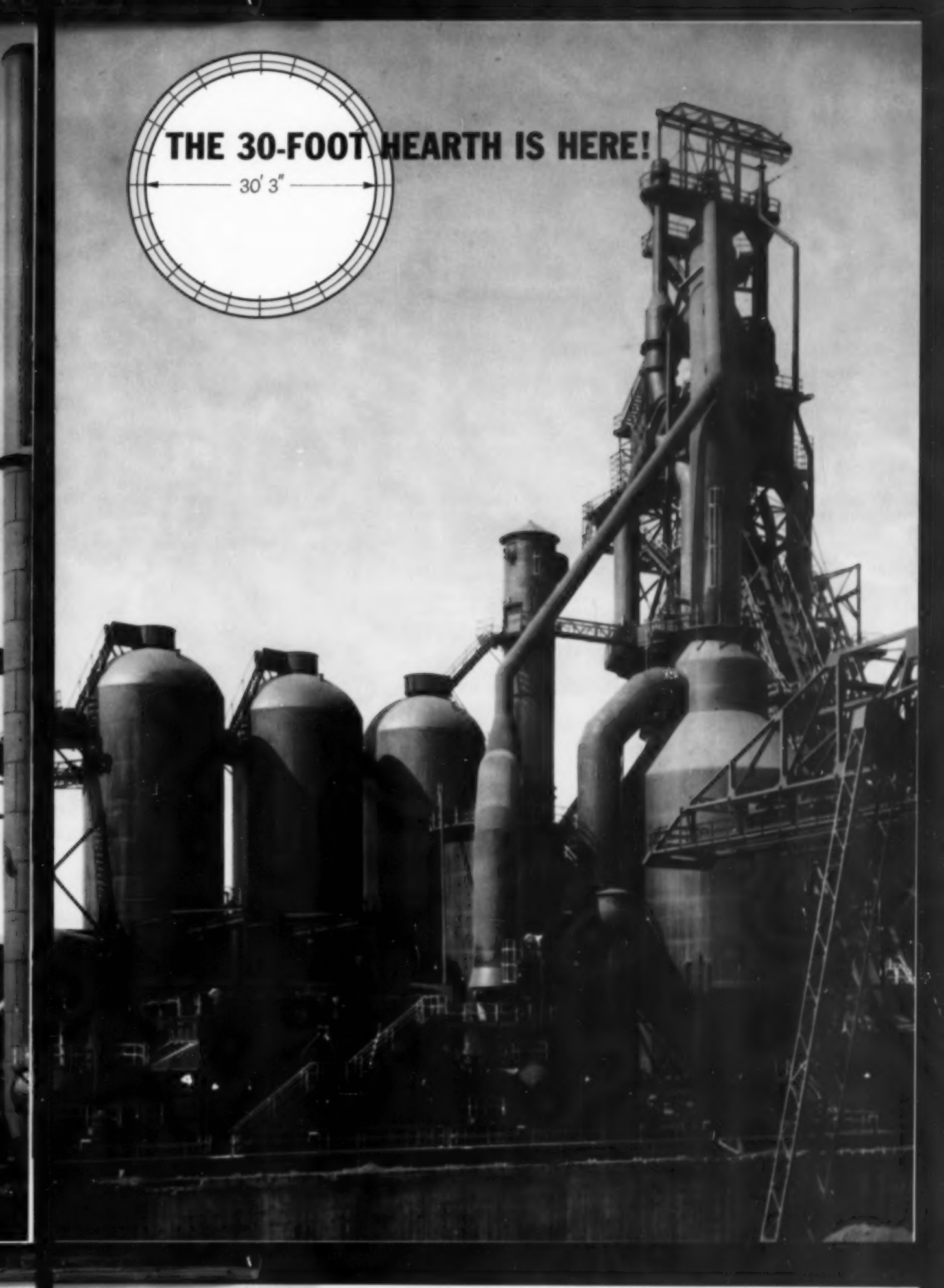
KOPPERS COMPANY, INC., PITTSBURGH 19, PENNSYLVANIA
FREYN DEPARTMENT

Great Lakes Steel's blast furnace at Zug Island, River Rouge, Michigan. With a hearth diameter of 30'3", this is the world's largest blast furnace.

Designing and constructing blast furnaces is just one way in which Koppers serves the steel industry. For any kind of metallurgical construction, you can count on Koppers. You are invited to consult with our Engineers and Management.

KOPPERS

KOPPERS
ENGINEERING
AND CONSTRUCTION


THE 30-FOOT HEARTH IS HERE!
30' 3"

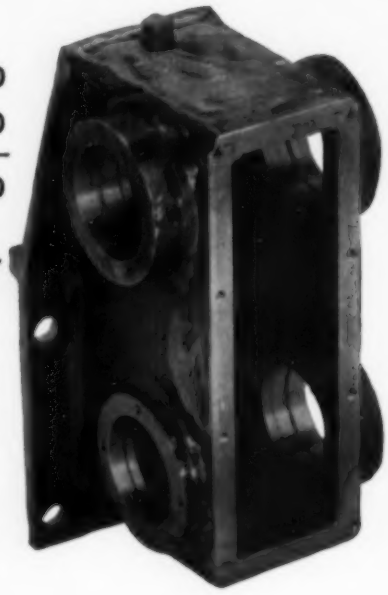
Case History No. 31 CHAIN BOX

GRAY IRON CASTING

initial cost	$ 9.22
machining	$12.50
TOTAL COST	$21.72

WELDMENT

initial cost	$21.00
machining	$23.50
TOTAL COST	$44.50



GRAY IRON SAVES OVER 50%

The cost of this Chain Box was cut more than half by switching to one, uniform-strength Gray Iron casting. And there are no more welded seams of varying quality to worry about! An important fact, since this chain box is used on rugged road-building equipment. Pattern costs were quickly amortized.

It will pay *you* to look for new, cost-saving ways to use Gray Iron . . . and at the same time obtain the other unique advantages inherent in modern Gray Iron castings. Gray Iron is durable . . . rigid . . . absorbs vibration . . . is heat and corrosion resistant . . . has low notch sensitivity and a wide strength range. It is truly the proved metal that meets modern design needs better and more economically.

For specific technical and business information, write direct to Gray Iron Founders' Society, Inc., National City—East 6th Building, Cleveland 14, Ohio.

This symbol assures you the most for your casting dollar

Here's why it pays to call in one of the more than 500 leading foundries displaying the Society symbol:

- The most recent technical and business information is available to each member through the Society to help you design better products at lower cost.
- The use of sound cost accounting procedures is recommended and encouraged among Society member foundries, assuring full value for your casting dollar.
- Improved castings result from the advanced techniques and the high sense of responsibility of Society members.

MAKE IT BETTER WITH GRAY IRON

GRAY IRON FOUNDERS' SOCIETY

ONE OF THE GARLOCK 2,000

Springless Klozure (cutaway) shown on a BALL BUSHING (linear ball bearing) manufactured by Thomson Industries, Inc., Manhasset, New York.

First Choice

FOR LINEAR MOTION, TOO!

Klozure* Oil Seals Protecting bearings from dust and other contamination is as important in linear applications as it is in rotary bearing applications. That's why Thomson Industries, selected Garlock Klozure Oil Seals Model 71-A for their linear ball bearing. Thomson found that the unique design of the 71-A and its synthetic rubber sealing element made it ideal for their limited space, low pressure, grease retaining application.

Let us show you how one of "the Garlock 2,000" can help you . . . you can choose from two thousand different styles of packings, gaskets, and seals to meet all your needs. It's the only *complete* line . . . it's one reason you get *unbiased* recommendations from your Garlock representative. Call him today or write for Klozure Catalog 10.

*Registered Trademark

THE GARLOCK PACKING COMPANY, Palmyra, New York

For Prompt Service, contact one of our 30 sales offices and warehouses throughout the U.S. and Canada.

GARLOCK

Packings, Gaskets, Oil Seals, Mechanical Seals, Rubber Expansion Joints

METALWOR

RINGS
have *always* been our business

Send your blueprints—we will be happy to work with you.

Amweld specializes in the production of circular weldments —rings, bands and components. American Welding is equipped to form, weld, fabricate and machine rings and weldments from 6 inches to 96 inches in diameter.

If your problem is a ring or component of ferrous or non-ferrous metal, including titanium or aluminum, consult Amweld's Industrial Products Division.

THE AMERICAN WELDING & MANUFACTURING CO.
110 DIETZ ROAD • WARREN, OHIO

AMERICAN WELDING

STEEL

July 30, 1956

Metalworking Outlook

Steel Strike Hits Road Program

Federal officials are worried that the steel strike has delayed the big highway construction program. The pinch is in plates and structurals which were tight even before the strike began. It's feared that deliveries of new roadbuilding equipment will be held up.

Highways of Steel

Highway construction of all kinds in the 13 years from 1957 through 1969 will require 49 million tons of steel, 1399 million barrels of cement, 128 million tons of bituminous material and 9710 million tons of aggregate, estimates the Commerce department's Bureau of Public Roads. At the peak of the program, 442,000 men will be employed directly on highway construction jobs. In the 13 years, largest quantities of steel will be needed in reinforcing bars (13.3 million tons) and wide flange shapes (11.8 million tons).

Fourth Quarter Metal Allotments

Fourth quarter steel set-asides at the mill level for "A" defense products will be 606,253 net tons, 2.4 per cent higher than for this quarter. Aluminum allotments will be 128,964,000 lb, 3.2 per cent higher than in this quarter. Set-asides for copper and copper-base alloys will be 50,709,000 lb, 2.6 per cent lower than for this third quarter. Nickel alloys will be set aside for the first time in the last three months, and the total has been put at 23,850,000 lb. The allotments represent the metal to fill orders of prime contractors and producers of specially designed military equipment.

Tool Shipments Slip

Shipments of machine tools in June totaled $75.9 million, slightly under the $76.8 million for May. Shipments for the first half averaged $69.7 million per month, compared with an average of $55.9 million per month during all of 1955. Net new orders declined in June, to $62.4 million, compared with $87.1 million for May. New orders for the first half averaged $84.9 million per month, compared with $77.3 million per month during all of 1955. June was the first month since April, 1955, when shipments exceeded new orders. Backlogs declined slightly, standing at about eight months' production at the end of June.

Prospects for Screw Products

Screw machine product sales may top $800 million by 1965, predicts the National Screw Machine Products Association. That's figured in terms of what 1965 dollars will probably be worth. In terms of 1953 dollars, the volume would be $700 million, compared with $485 million achieved last year. The association forecasts fewer, but larger, screw machine

Technical Outlook—p. 91 Market Outlook—p. 135

products producers. Hourly wages and salaries of employees will increase 25 per cent.

Sidelight on Automation

Don't overlook the impact of shift work on employees as you progress more and more toward automation. That's particularly true in automating office operations, reports University of Michigan's Institute of Social Research. Office workers who have never known anything but a 9-to-5 routine are suddenly confronted with shift work to meet the demand of keeping automatic equipment operating round the clock for maximum efficiency. Personal adjustment by the employee is often difficult.

Colorful Truck Trailers?

As anodizing techniques are improved and become practical for truck-trailer manufacture, you'll see big trailers on the highway as garish as today's three-toned passenger cars. Tests reported at a Truck-Trailer Manufacturers Association meeting show that anodized aluminum surfaces will last up to 14 years. That should increase the use of aluminum in trailer manufacture. Today, about half the van-type units have aluminum skins. Regardless of metal used, trailer makers, barring steel strike complications, will build more than 82,000 units this year, compared with 1955's record 76,500.

Bauxite from Venezuela

Several U. S. firms are investigating newly located bauxite deposits in eastern Venezuela. Among them: M. A. Hanna Co., Kaiser Aluminum & Chemical Corp., Reynolds Metals Co. and Aluminum Co. of America. The deposits contain 46 per cent bauxite, 23 per cent iron oxide and 7.5 per cent silicon. Reynolds is reported to be studying the advisability of building a processing plant on the spot. The Venezuelan government may have other ideas. Calculated reserves in the area are 10 million tons; if Venezuela built its own plant, it could eventually export aluminum.

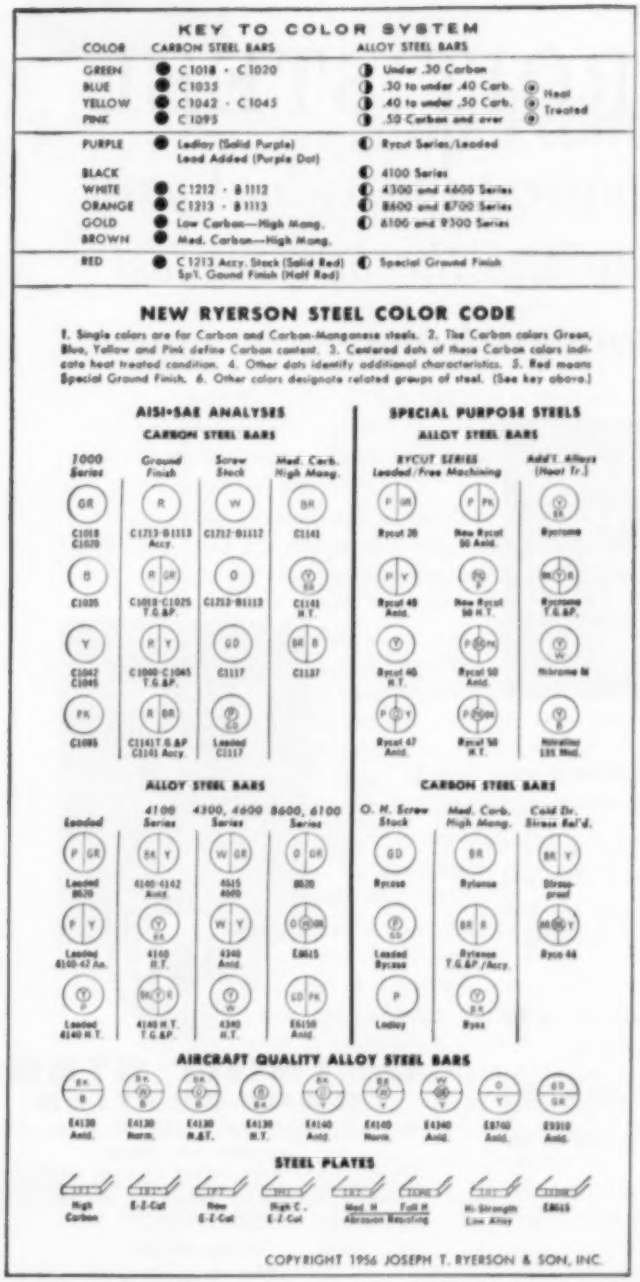
Nickel from Cuba

The U. S. owned nickel plant at Nicaro, Cuba, produced 31,460,000 lb (primarily in sinter form) during the 12 months ended June 30. Last year's production was 29,504,000 lb. Capacity is currently being boosted to 49 million lb. The plant is operated by Nickel Processing Corp., a subsidiary of National Lead Co.

Straws in the Wind

Ohio has O. K.'d a vested glass-type Supplementary Unemployment Benefit plan but has still not approved the auto type . . . Competitive bidding for leasing uranium deposits (rather than negotiated leases) is the new Atomic Energy Commission rule . . . The Institute of Scrap Iron & Steel will file a new complaint with the Interstate Commerce Commission on scrap's freight rates . . . American Brass Co. is shipping flexible metal hose and tubing from its new plant at Mattoon, Ill.

NEW COLOR CODE for steel identification



KEY TO COLOR SYMBOLS:

A—ALUMINUM BK—BLACK GD—GOLD O—ORANGE PK—PINK W—WHITE
B—BLUE BR—BROWN GR—GREEN P—PURPLE R—RED Y—YELLOW

For Stainless steels and other products, see your Ryerson Stock List

More logical system aids quality control

Accurate identification of steel—always a point of paramount importance with Ryerson—now becomes even more meaningful than before with the introduction of a new system of color marking.

Based on logical groupings of related types of steel, this new Ryerson color code is easy to understand, remember, and use. It strengthens still further the rigid program of quality control that for years has guarded the known high uniform quality of Ryerson Certified Steel.

Here's how the system works:

1. Single colors are used for standard Carbon and Carbon Manganese Steels.
2. The colors GREEN, BLUE, YELLOW AND PINK always define Carbon content.
3. Centered dots of these Carbon colors always indicate the heat treated condition.
4. Centered dots of other than Carbon colors identify characteristics other than analysis, carbon content or the heat treated condition.
5. PURPLE, BLACK, WHITE, ORANGE, GOLD and BROWN each designate a related group of steels.
6. RED marking of any kind always indicates Special Ground Finish.

If you do not already have this new steel identification chart, we will be glad to send a copy (printed in full color) for your Ryerson Stock List. Call or write your nearby Ryerson plant, or write Box 8000-A, Chicago 80, Illinois.

RYERSON

JOSEPH T. RYERSON & SON, INC.

PLANTS AT: NEW YORK · BOSTON · WALLINGFORD, CONN. PHILADELPHIA · CHARLOTTE, N. C. · CINCINNATI · CLEVELAND DETROIT · PITTSBURGH · BUFFALO · CHICAGO · MILWAUKEE ST. LOUIS · LOS ANGELES · SAN FRANCISCO · SPOKANE · SEATTLE

July 1956
Fortune Reveals

DETROIT STEEL

scored the year's biggest individual gain in sales-ranking among the 500 largest U.S. industrial corporations.

DSC Climbed to 302nd Position in 1955 from 484th in 1954 on a 97% Rise in Sales to $101,800,000

This sales performance offers evidence of customer confidence in DSC products and services.

It confirms our own confidence in again increasing ingot capacity from 1,290,000 tons to 1,500,000 tons and further expanding our facilities for producing hot and cold rolled sheets as well as other DSC products—in 1956.

It re-emphasizes the soundness of two basic ideas by which we have always tried to run our business:

- Customer satisfaction is everyone's No. 1 job at DSC.
- The proof of DSC steel is in its performance on the customer's job.

Thanks to our customers and employees who helped make this sales performance possible.

M. J. Inman
President

CUSTOMER SATISFACTION IS OUR BUSINESS

DETROIT STEEL

DETROIT STEEL CORPORATION

GENERAL SALES OFFICE, DETROIT 9, MICHIGAN

CUSTOMER "REP" OFFICES:

Charlotte, N. C., Chicago, Cincinnati, Cleveland, Columbus, Ohio, Dayton, Ohio, Detroit, Grand Rapids, Mich., Hamden (New Haven), Conn., Indianapolis, Jackson, Mich., Louisville, Ky., New York, St. Louis, Toledo, Worcester, Mass.

DSC MILL PRODUCTS

Hot Rolled and Cold Rolled Sheets
Cold Rolled Carbon Steel Strip • Flat Cold Rolled Carbon Spring Steel
Low and Med. Carbon Manufacturers' Wire • High Carbon Specialty Wire
Aluminum Cable Strand Reinforcement • Rope Wire • Tire Bead Wire
Welded Wire Fabric

MILLS | PORTSMOUTH, OHIO (Sheets, Rods, Wire)
DETROIT, MICH. and HAMDEN, CONN. (C.R. Strip)

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Stop Economic Waste!

The steel strike raises the question of how to prevent work stoppages in basic industries which hit the entire economy with so much economic waste.

The cost of the steel strike can never be computed precisely, but its appalling effects were plainly manifested in the $238 million lost to wage earners and the $880 million worth of steel products that could not be delivered to customers.

And don't forget the 200 idle vessels which couldn't bring down the iron ore that may be needed in the winter months ahead; or the layoffs starting in metalworking plants and the slowed-down projects dependent on structural steel, plates and pipe.

One solution lies in the Taft-Hartley Act passed in 1947. If gives the President the choice of letting industry and labor negotiate a peaceful settlement or invoking powers granted under the act. If the government steps in, the procedure would be this:

1. Appointment of a board to get the facts. 2. If national safety or health is at stake, the President can ask a federal court for an injunction ordering the union to suspend the strike for an 80-day cooling off period. 3. During that time, the federal mediator tries for an agreement. 4. If there is none, workers are asked to vote on the industry's last offer. 5. If it is accepted, the strike ends. If it is rejected, a new strike may be called and the President's only recourse is congressional action.

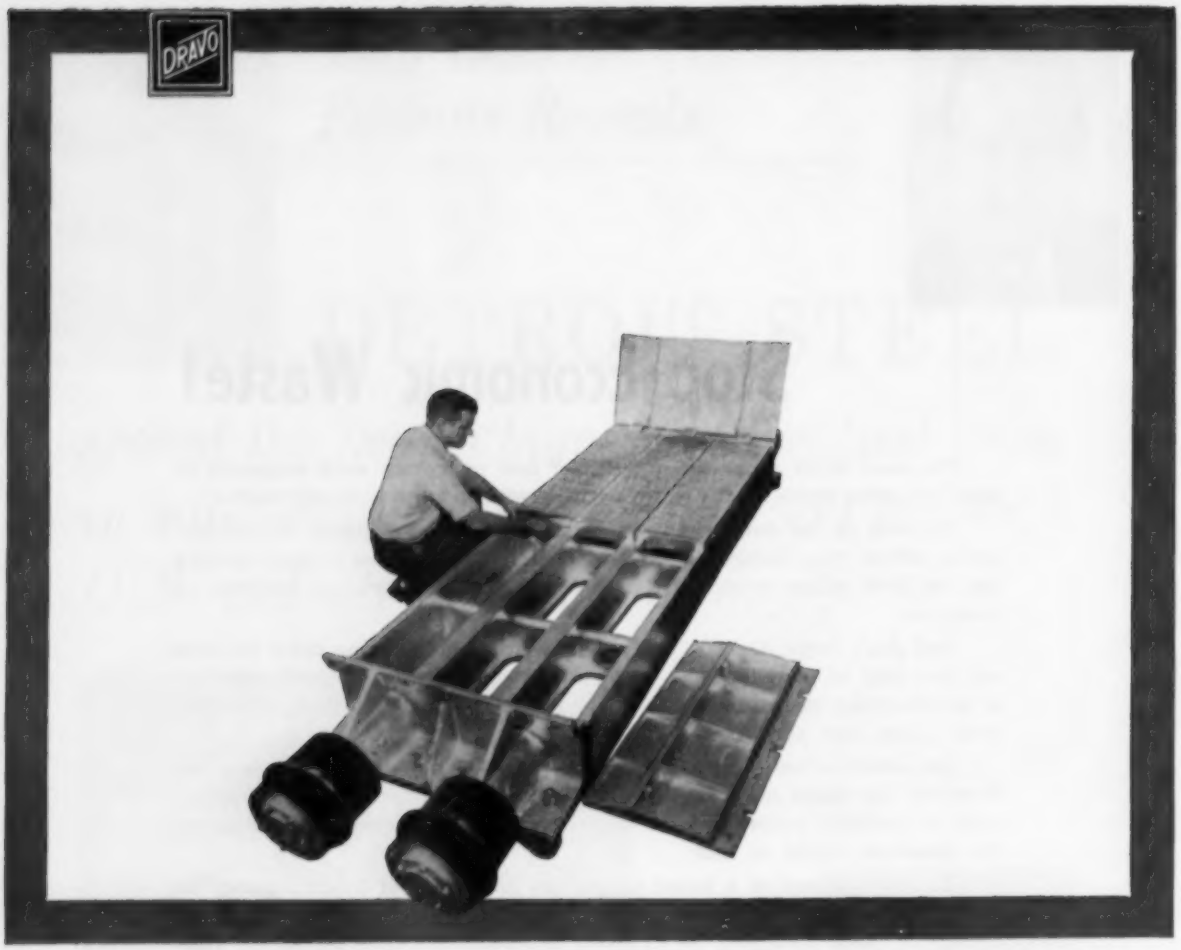
In the belief that industry and labor can best solve their problems through direct negotiation, the government has found it necessary to invoke the Taft-Hartley Act on only ten occasions.

The temptation to make the 1956 steel strike number eleven can't be discounted. The unions still do not have the desire to negotiate objectively. Union management is doing too much name-calling and face-saving. It is misusing statistics and agitating for the obvious purpose of convincing the rank and file that it is performing its job.

As the unions grow older and more powerful, they must grow in stature, learn to negotiate with industrial management in a businesslike manner. It is the only sensible approach in a free economy where the goal of every American is to achieve a higher standard of living and more leisure time.

The economic waste we have been witnessing is not compatible with the achievement of this goal.

Irwin H. Such
EDITOR-IN-CHIEF



DRAVO-LURGI

sintering experience . . . ready to work for you

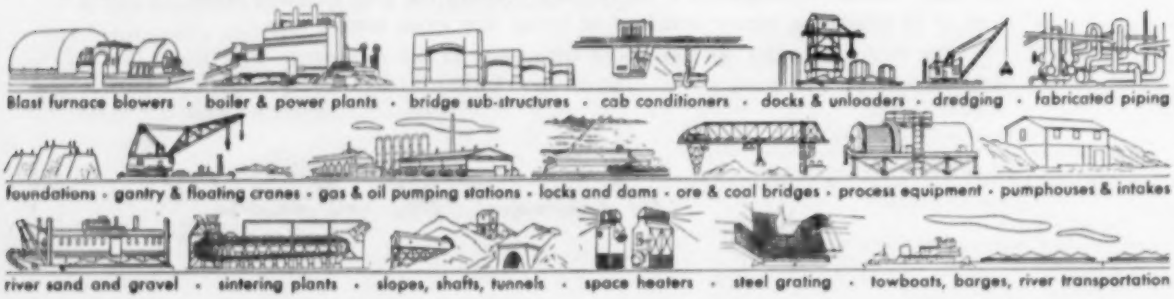
More than 250 sintering plant installations qualify Lurgi as Europe's oldest and foremost designer of equipment for the treatment of low grade ore. In fact, the total capacity of Lurgi sintering machines now processing iron ore alone is in excess of 30 million tons annually.

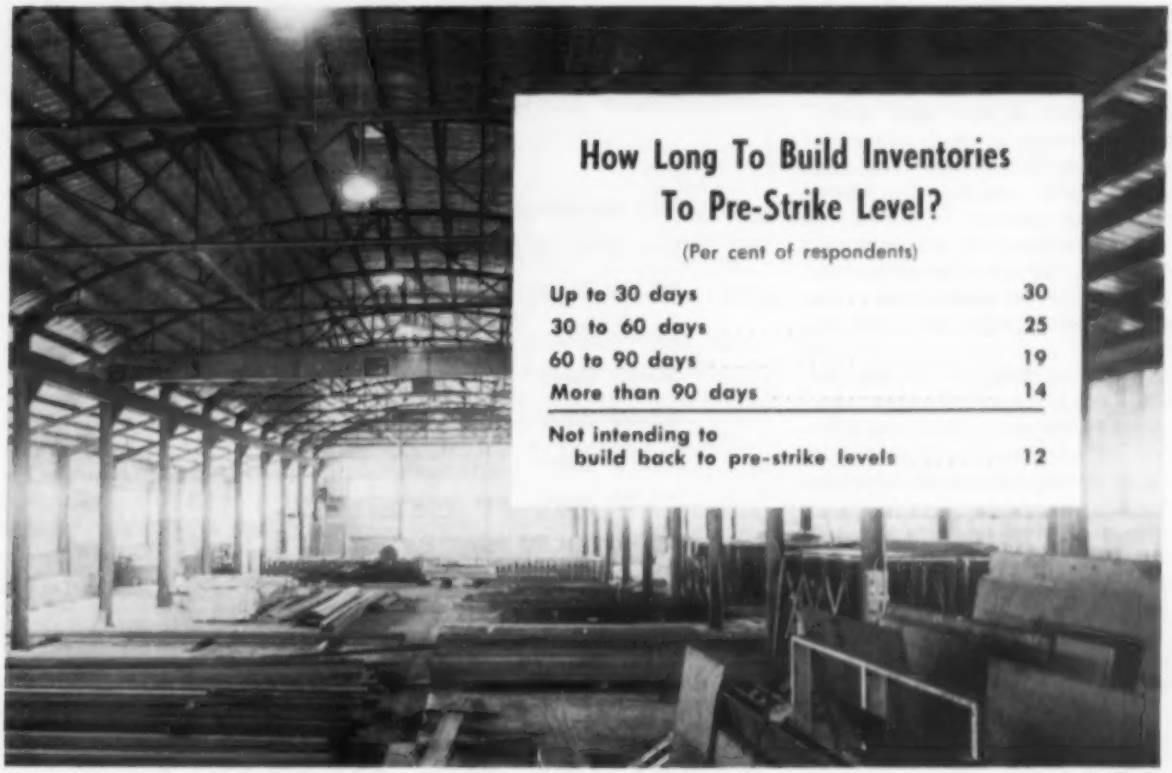
An exclusive license agreement enables Dravo to adapt these advanced designs to the needs of American industry.

In a major installation recently completed by Dravo, 124 pallets, like the one shown above, are used. Design features of these pallets are the result of Lurgi's 30 years' experience in sintering machinery construction.

Engineering and planning assistance is available to help you develop equipment or complete plants for sintering, pelletizing or other related ore processing and preparation. Write to Dravo Corporation, Dept. S-100, Pittsburgh 22, Pa.

DRAVO
CORPORATION


Blast furnace blowers · boiler & power plants · bridge sub-structures · cab conditioners · docks & unloaders · dredging · fabricated piping
foundations · gantry & floating cranes · gas & oil pumping stations · locks and dams · ore & coal bridges · process equipment · pumphouses & intakes
river sand and gravel · sintering plants · slopes, shafts, tunnels · space heaters · steel grating · towboats, barges, river transportation



How Long To Build Inventories To Pre-Strike Level?

(Per cent of respondents)

Up to 30 days	30
30 to 60 days	25
60 to 90 days	19
More than 90 days	14
Not intending to build back to pre-strike levels	12

Butler Mfg. Co.

After the Strike: The Pinch

Buyers are set for the scramble for steel. Question: Can (and how soon) will metalworking make up for the $1 billion-plus lost to the economy during the strike?

THE ROAD back will be a rocky one for steel and steel products users. It's the old story: A strike's greatest impact isn't felt until it is over.

It will take almost one third of the respondents to a special survey by STEEL at least 30 days to get their inventories back to the pre-strike level (see table above). Their estimates of the time required range from seven days to nine months.

Experience—On the basis of mill deliveries during the first half of the year, a Salem, O., toolmaker says he will need 180 days to rebuild his inventories of plates and structurals. A Tulsa, Okla., fabricator had a 45-day supply of plate and pipe before the strike. He hopes to have stocks rebuilt by Nov. 1.

Smaller fabricators have been hit hardest, says a Jefferson City, Mo., purchasing agent. He wants mills to increase allocations to small users during the post-strike scramble for steel.

Underlining the seriousness of the situation: "We have not really picked up our structural steel inventory since March of last year," says a Utica, N. Y., buyer.

Prepared Ones—Monday morning quarterbacking department: Perhaps inventories weren't as high as some experts figured before the strike began. Only 12 per cent of STEEL's respondents say their pre-strike stocks were abnormally high.

But even those firms will have trouble. A Youngstown company which bought in anticipation of the strike says it will take from 30 to 120 days to obtain a normal inventory.

The 88 per cent of the respondents who hope to regain their pre-strike position have but one thought: How soon will the mills start delivering? You can expect to see these purchasing agents standing in line for steel.

Timetable — Maintenance crews have been protecting the coke ovens and furnaces in the struck mills. A 30-day strike doesn't cause too much damage, so full production can be expected within three to four weeks.

In 1952, the industry achieved

42 per cent of capacity production in the first week following the 53-day strike. In the second week, production was almost up to the 90-per-cent rate.

"But when you start up an open hearth after it has been down, there's always a roof falling in somewhere; that's something you can't foresee," reports a Cleveland steel plant manager.

Troubles like that will make it difficult to hit capacity production (the last 10 per cent is the hardest) as fast as metal users will demand.

$ Billion Mark — Besides the 500,000 striking steelworkers, about 50,000 coal miners and 150,000 other workers have been laid off in metal servicing or using industries.

Sales of steel products lost and lost wages have brought the strike's total cost to $1118 million (see box below).

Of the respondents to STEEL's survey, about 18 per cent have had to curtail production. Cuts range from 5 to 80 per cent of total production, with an average cut of about 25 per cent.

Recovery — To keep the boom rolling, the nation will need a record fourth quarter. It appears certain that the demand for steel and steel products will be at a fever pitch. On the basis of estimates of present needs, the construction industry will be crying for more structurals well into 1957. There has been little real relief in the plate shortage.

The scramble for most kinds of steel, plus the steel and other price increases that are certain to come, add up to a frantic fourth quarter. The inflationary impact of this strike will be felt into 1957.

Strike's Cost

	(in millions)
In steel product sales	$ 880
In steelworkers' wages	200
In other wages	38
Total	$1118

Nonintegrated Mills: How Long Can Stocks Last?

	Per cent of respondents
Not operating	10
Less than 10 days	3
10-20 days	3
20-30 days	13
30-45 days	26
45-60 days	16
60-75 days	7
75-90 days	13
More than 90 days	9

Steel for the Recovery

Nonintegrated mills are a big factor in the strike recovery period. They'll help fill the pipeline while integrated plants get back to capacity operations

SECONDARY makers of steel products have kept producing throughout the strike for the most part (see table above). About 130 of these nonintegrated mills buy the hot stock from the primary steelmakers and process it.

While 90 per cent of them have operated, that doesn't mean capacity production will be possible for the rest of the year.

Pay the Piper—Like users of steel products (see page 49), a major concern of the nonintegrated mills is the recovery period after the strike. Comments a California mill: "We must pay the piper ultimately. What time we have operated during the strike, we'll lose later in a shutdown or partial operations while the pipeline from the primary producers is being refilled.

"On material originally promised for July delivery, one primary producer is quoting delivery three to five months after normal resumption of hot mill operations."

Stocked Up—About 20 per cent of the respondents to this STEEL survey of nonintegrated mills have a 30-day (or less) supply of material on hand. That group, plus the 10 per cent who closed during the strike, will be hit hardest in the recovery period after the strike.

The other plants stocked up ahead of the strike or have been getting their material from the hot mills which didn't close.

Says a Wisconsin shaped steel wire firm which now has a 30-day supply of raw steel: "By the time our present stocks are exhausted, we should be getting sufficient steel deliveries for normal production, if the hot mills are at capacity operations." The experts are guessing the nation's primary producers won't achieve capacity operations for three to four weeks from the date of the settlement.

Adding Up the Cost

One significance of any steel settlement will be its effect on other wage negotiations. Watch for other metalworking unions to jack up their asking price

JOHN Q. STEELWORKER's new contract will put him in a spot that will be envied by many other industrial wage earners. Even before the strike began, he was doing better than most.

Since 1949, his average earnings increased by an average of more than 80 cents an hour. No other comparable group of industrial workers made such a rapid gain.

Top Dog—Before the strike, his earnings were running at an average of over $5200 a year. In addition, companies paid out a further $470 a year for pensions, insurance and other benefits which don't show up in the pay check.

His real wages (making adjustment for inflation) have risen 43 per cent since 1949.

Controversy — Companies and union are still at odds over the interpretation of such statistics. David J. McDonald, president of the United Steelworkers of America, said last week that since 1945 the steel companies had raised prices by a ratio of $3.19 for each $1 granted in wage increases. Further, he added, material costs had gone up 27 per cent since 1947, while steel prices had risen over 78 per cent.

Said the companies: Since 1940, costs have advanced at a rate of 8.2 per cent a year; steel prices have gone up only 5.4 cents a year. C. M. White, president, Republic Steel Corp., Cleveland, charges union economists with choosing their figures with an eye to convenience rather than realism. The union used productivity figures beginning in 1939, a year when the industry operated at only 66 per cent of capacity. Prices and wages, says Mr. White, were compared from 1947 to 1955, while profits were compared from 1954 to 1956.

Comparison — The companies maintain that the steelworker has gained ground far faster than the average. Their proof: While national productivity has increased 22 per cent since 1949, the steelworker's real wages have gained 43 per cent. Increases in productivity, say the companies, measure the rate at which the general standard of living is rising.

They note that the offer they originally made to the union in June would have increased the hourly costs of wages and benefits by some 23 per cent over a five-year period, for an average increase of more than 4 per cent a year. This, they point out, is considerably above the average annual increase in productivity.

Stumbling Block—One of the major issues of the strike, length of contract, is highlighted by a new study from the National Industrial Conference Board, New York. In 1948, only 24.6 per cent of contracts analyzed by the board were for more than one year. In 1950, 46.4 per cent were for more than one year. In 1956, the proportion has risen to 56 per cent.

For the period from June last year to early this year, the Conference Board looked at 923 contracts signed by 12 major unions. Of those lasting more than two years, 82 were signed by the auto workers; 17 by the machinists, 17 by unions representing electrical workers, 12 oil, chemical and atomic workers, 7 by teamsters and 3 or less by each other major group, including steel.

Past Steel Labor Settlements

1955 **Average wage rate increase of 15.2 cents per hour, consisting of 11.5-cent hike in minimum rate plus boost in job class increments of 0.5 cent, bringing differential to 6 cents.**

1954 **5 cents in direct wage hike across the board; 4 cents in increased contributions to insurance, to be split by company and worker; pension boost from $100 to $140 per month.**

1953 **8.5 cents in straight hourly wage boost; end of the north-south wage differential to come by July 1, 1954.**

1952 **Average wage rate increase of 16 cents per hour, consisting of 12.5-cent boost in minimum rate plus hike in job class increments of 0.5 cent; 6 holidays, better vacations, union security.**

1950 **Average wage rate increase of 16 cents per hour, consisting of 12.5-cent boost in minimum rate plus hike in job class increments of 0.5 cent.**

1949 **Noncontributory pension and contributory insurance plans.**

Reynolds Starts Plant

Construction of Reynolds Metals Co.'s aluminum reduction plant at Listerhill, Ala., has started. A contract has been placed which calls for the spending of $75 million to $80 million.

The 200-million-lb-a-year plant is scheduled to be completed before the end of 1957. The steel strike is not expected to cause an interruption in construction. Supplies were purchased before the walkout.

Stephen Ingersoll Dies

Stephen L. Ingersoll, president and general manager of the Ingersoll Steel Division, Borg-Warner Corp., Chicago, died Sunday, June 22. He was 61, and had been with the company since 1920.

Jobbers Limited on Steel Deliveries

(Weekly quota per customer when stocks hit half June 30 level)

	Pounds
CARBON STEEL	
1—HR bars, bar shapes, except reinforcing	4,000
2—Plate (except floor plate, abrasion resistant plate, and plate less than ½-in. thick)	2,000
3—Pipe, tubing	4,000
NICKEL-BEARING ALLOY (except stainless)	
4—HR bars, bar shapes	2,000
5—Sheet, strip	2,000
6—Plate	2,000
7—Pipe, tubing	2,000
NON-NICKEL BEARING ALLOY (except stainless)	
8—HR bars, shapes	4,000
9—Sheet, strip	4,000
10—Plate	2,000
11—Pipe, tubing	4,000
NICKEL-BEARING STAINLESS	
12—HR bars, bar shapes	1,000
13—Sheet, strip	1,000
14—Plate	1,000
15—Pipe	1,000

Warehouse Freeze Thaws

Modified U.S. control permits distributors to deliver certain steel products on nondefense orders until their inventories fall to 50 per cent of June 30 levels

THE GOVERNMENT'S freeze of warehouse steel stocks, banning shipments of specified products except on defense account, was modified by the Business & Defense Services Administration, effective July 20.

Direction 8 to Defense Materials System Regulation 1 supersedes temporary Direction 7 which went into effect July 6.

The new regulation limits weekly shipments of nondefense orders only when a distributor's supply of a specified item is reduced to 50 per cent of his June 30, 1956, inventory of that particular product.

Prohibits Shipments — Barred are deliveries against unrated orders of all types of aircraft quality steel, nickel bearing steel plate over 72-in. wide, or any nickel bearing stainless steel plate over ½-in. thick.

When the distributor's inventory reaches the 50 per cent point, his weekly shipments to a single customer against nondefense orders may vary (see table).

Exemptions to the limitations are possible where shipment consists of a single mill piece exceeding the listed weight.

The new order confirms voluntary shipment controls effected by the warehouses. Observance of the regulation is up to the distributor. The American Steel Warehouse Association is making inventory checks, assisting the governmental agency in keeping track of inventories and the rate of depletion.

Sales Liberalized—Immediate effect of the new regulation is to eliminate the possibility of duplicate purchases from one distributor in one week. It also liberalizes warehouse sales, especially of alloy steel, stocks of which are reported substantial, except for nickel bearing grades. Only sales of heavy plates, nickel stainless and nickel bearing alloys are likely to be much affected the next few weeks.

At June's end, the nation's 1200 industrial steel warehouses held estimated inventories totaling 2.5 million net tons. They were unbalanced, however. Normal monthly warehouse shipments are estimated to run around 700,000 tons, but about 25 per cent of total shipments are made up of plates and shapes, which products were in low inventory at the warehouse level before the strike.

Drain—The July shipment drain on warehouse stocks probably did not include a heavy plate and shape tonnage. Actually, total steel shipments in July were considerably under 500,000 tons because of widespread manufacturing plant suspensions for mass vacations and substantial consumer inventories. Also, most warehouses throughout the month continued to take in steel from those mills not closed.

Settlement of the steel strike will have little effect on the supply of steel available from warehouses. Industrial sources say that the freeze order will be lifted as soon as steel mills are able to get production back to normal levels.

If demand follows traditional patterns, it should be at least six weeks before warehouse stocks are depleted to the 50 per cent level. But the Defense department and the Atomic Energy Commission have authorized defense contractors to place larger orders than usual at warehouse prices. If this permission is used, these stocks will melt faster. It will be tougher for the mills to refill supply pipelines in time to prevent effects of the freeze from hitting all commercial users.

Trouble for Lake Shipbuilders

Legislation is needed to hasten the replacement of obsolete ore carriers. When the seaway opens in 1960, there will be increased competition for lake shipbuilders

WORK IN PROGRESS among five Great Lakes shipbuilders with facilities capable of constructing modern ore carriers: One ore vessel in the engineering stage and two LSTs under construction at American Shipbuilding Co., Cleveland.

Medicine—H. R. 8886 is a remedy for the situation. The bill would provide a credit allowance from the government to shipowners on traded-in obsolete ore carriers. The old ships would be mothballed for a national emergency.

The Senate passed a similar bill, then changed its mind because amendments from the floor were shown to be inconsistent with the bill itself and with present maritime policies.

The House bill is tied up in committee where legislators want similar action for coastal shippers included. It now looks like the project must wait until the new Congress convenes next year.

Anchors Aweigh—Last year the U. S. Navy let contracts for six LSTs, specifying that two were to be built on the lakes. To get more naval business, says Capt. M. H. Gluntz, supervisor of shipbuilding, Ninth Naval District, Chicago, lake shipbuilders may have to refurbish their physical facilities, and boost their know-how of ordnance equipment, electronics and nuclear power plants.

Concludes Captain Gluntz: "The Great Lakes shipbuilder is aware that when the St. Lawrence Seaway is opened, his own competitive strength rather than navigational obstacles will determine his naval construction workload."

Seaway Hopes—The captain's comments about the seaway's role in lake shipbuilding applies to more than naval tonnage. Says M. L. Ingwersen, vice president-operations, American Shipbuilding:

1. For the first time the seaway will put lake shipbuilders in direct competition with coastal builders. The new 27-ft depth will enable coastal builders to send their products far up the lakes.

2. Foreign shippers will flock into the lakes via the seaway, and they will be using foreign bottoms. No repair work can be expected from these ships (except in extreme emergencies).

3. Finally, says Mr. Ingwersen, the seaway may not bring about the immediate boom in lake shipping that some persons expect. He foresees a slow, but steady, growth, noting that shippers who have been using the railroads or trucks won't change their habits overnight. The nine months' season on the lakes must also be reckoned with.

Bottleneck—It now takes eight to 12 hours to clear the Welland Canal, the link between Lake Erie and Montreal. This is the real bottleneck to lake shipping, says one source: "You can't expect the seaway to be any better than its weakest link."

It will cost the Canadian government $100 million to twin the locks of the canal. As yet, no action has been taken on the project, although Canada is expected to come through eventually.

A final fact about the seaway: L. R. Sanford, president, Shipbuilders Council of America, thinks the seaway will mean more foreign flags carrying iron ore between Canada and the U. S. As Mesabi supplies decline, U. S. will need more Canadian ore.

Diversification — One answer when your industry isn't doing well enough to provide you with a good business: New products. Manitowoc Co. Inc., Manitowoc, Wis., has been doing that "for over 50 years," reports R. D. West, executive vice president. Besides building ships, the firm makes refrigeration products and crawler cranes.

Repair and reconstruction work is now the principal concern of Manitowoc Shipbuilding Inc. (as it is for the other lake shipbuilders), although the affiliate is actively interested in bidding on new ships. Mr. West sees no revival of lake shipbuilding, and comments: "We are not going to rely on governmental work."

The hull side tank sections of an LST (U.S.S. Lorain County) are being assembled at the Lorain, O., shipyard of American Shipbuilding Co.

Revolution on Wheels

Mobile homes are changing America's way of living and can change metalworking's sales patterns. In growing quantities, they need steel, aluminum, copper, fittings, appliances

MOBILE HOME (house trailer) sales will hit another record this year and should reach $500 million before the end of the next decade.

Nearly 3 million people live today in the approximate 1 million mobile homes in use. New units are being sold at a rate of more than 100,000 a year, 100 times the unit pace of 25 years ago and more than 300 times dollar volume of 1931, when the industry started.

Stability—Sales gains are running ahead of the general economy's advances, says Mobile Homes Manufacturers Association, Chicago, and that indicates the industry has developed a firm and expanding market. Of mobile home owners, 63 per cent are mobile or semimobile workers; 20 per cent are in the armed forces; 10 per cent are retired; 7 per cent are in miscellaneous occupations, including salesmen and engineers who may use them for laboratories, showrooms and field offices. Only 2 per cent of all house trailers are purchased for vacations or travel.

Nearly 200 manufacturers and 3500 dealers offer mobile homes at prices ranging from $2000 to $7500 and even higher on special jobs, points out Mobilehome Dealers National Association, Chicago. The average price of a new unit is $4500.

Size—Sizes range from 22 ft to 50 ft in length and up to 10 ft in width. Some 34 per cent currently produced are 45 ft or longer. Only 20 per cent was in that category last year. Average weight of a 45-ft model is 9000 lb.

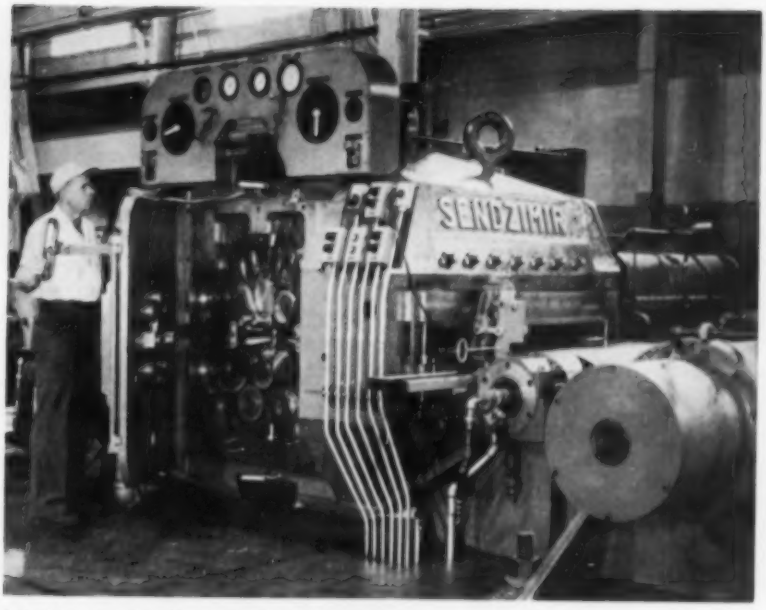
New in mobile homes are models 10 ft wide, placed on the market a year or so ago. Some 30 manufacturers are producing those in 35 to 52-ft lengths. Highway regulations restrict or prohibit over-the-road movement in some states, necessitating rail transportation or special permits.

Movable — Manufacturers and sellers state that standard autos still can haul the average unit. But with more 10-ft wide models being built, look for the licensed convoy specialists in mobile home hauling to gain in the movement business.

The average mobile home is moved only once every 12 months. The emphasis is switching from "mobile" to "home."

Construction—In house trailers, steel is used primarily in the undercarriage, axles, etc., with very little above the floor line. Aluminum is the most common exterior covering, aggregating 250 to 275 lb. One of the notable exceptions to aluminum construction, however, is the product offered by American Coach Co., Cassopolis, Mich., which utilizes electro-zinc coated steel sheets for the exteriors—sides, ends, tops and bottoms—of its house trailers. Average use is 1740 lb per coach. The chassis requires about 500 lb of 6 and 8-in. beams, with chassis truss-type cross members and miscellaneous steel requirements totaling about 300 lb. Copper, mostly in wiring and some brass fittings, runs about 15 lb per coach.

Features in mobile homes, although some are more frequently offered as optional equipment rather than standard, now include all of the latest household appliances, air conditioners, etc.



Washington Steel's new Sendzimir mill can produce stainless steel in coils weighing up to 11,500 lb and 48 in. in width

Washington Steel Expands

FOR Washington Steel Corp., the unveiling of its newly expanded facilities in Washington, Pa., last week had more than usual significance.

Formed in 1945, at the end of World War II, the company took over the plant buildings of the defunct Washington Tin Plate Corp. to go into the stainless steel sheet and strip business.

First Steps—President Tom S. Fitch and his associates had noted that stainless steel production was doubling every ten years, and they believed further growth was ahead. So they rounded up $1.5 million to buy a 39-in. Sendzimir mill and auxiliary equipment for the conversion of hot-rolled coils purchased from other mills into cold reduced sheets and strip up to 36 in. wide.

The Sendzimir mill with its small work rolls and clusters of backup rolls had the advantage of rolling stainless steel at high speed to close tolerances in thin gages. To the customer, eliminating the crown on wide sheets meant more surface area per ton of product.

In 1955, Washington Steel's sales were $20 million, its shipments 19,000 tons.

Progress—A survey made late in 1954 indicated a substantial market for stainless in widths over 36 in. and up to 48 in. To purchase the 52-in. Sendzimir mill and related equipment needed to make the wider material, Washington Steel raised $2.6 million through loans and additional equity financing.

The new mill can turn out 3500 tons of stainless a month, supplementing the 1500-ton monthly output of the smaller mill that went into operation in April, 1947. Auxiliary equipment includes three continuous annealing and pickling lines, two upcut shear lines for handling either 36 or 48-in. wide coils, two hydraulic stretcher-levelers, a continuous grinding and polishing line and slitters for narrower material.

Product—As an answer to the nickel shortage, Washington Steel is pointing out to its customers that Type 430 (17 per cent chromium, no nickel) is freely available without restriction, while conventional Type 302 (18-8 chromium-nickel) can only be supplied against rated orders.

Type 430 is similar to 18-8 in appearance, has excellent corrosion resistance, costs 10 cents a pound less and may be readily fabricated. Current applications include sinks, washing machine tubs and refrigeration equipment. Big outlet is in decorative trim for autos which will take 52 lb per car in 1957, compared with 46 in 1956. In 1955, 30 per cent of the 1.2 million tons of stainless produced were Type 430.

Look Ahead—By 1960, Mr. Fitch expects that stainless steel production will be nearly 50 per cent higher at 1.5 million tons. Over a third of that production, he thinks, will be the straight chromium type for he sees no early relief in the nickel shortage.

The fact that five other stainless steel producers have 52-in. Sendzimir mills in operation or on order is not at all disconcerting to Mr. Fitch.

Republic Steel Corp. placed one in operation last year. U.S. Steel's mill at Vandergrift, Pa., will be ready late this year, as will one for Eastern Stainless Steel Corp. at Baltimore. A mill purchased by Titanium Metals Corp. for rolling titanium and operated by Allegheny Ludlum at Brackenridge, Pa., will be ready early in 1957 and may have some capacity available for stainless. Crucible Steel's new mill at Midland, Pa., which also will roll titanium for Rem-Cru Titanium, will be ready by the second quarter of 1957.

Sales—Washington Steel follows the basic policy of selling through distributors who may also handle other stainless steel lines, aluminum, brass and galvanized sheets. Distributor sales average 300 lb per order.

A new market for stainless is seen in skins for supersonic aircraft. Samples have shown excellent results at temperatures as high as 1300°F. Other expanding markets are in curtain wall construction for buildings and honeycomb structures such as those being used by Convair at Ft. Worth.

Tax Action in '57? House Unit To Hold Hearings

TAXES will be a hot topic in Washington in 1957. Republican and Democratic leaders have called for revisions of the federal tax code. Pointing up the prospects for action next year is the formation of a subcommittee on internal revenue taxation by the House Ways & Means Committee. The subcommittee can look into any phase of the tax problem it chooses. But since a report is due to the full committee before Congress reconvenes in January, lack of time likely will restrict the inquiry to a few specific points—probably tax rates and loopholes. Most of the group's work will be done in November and December, after elections. If the Democrats retain control of the House, the subcommittee will probably be retained to make a more extensive study. If the Republicans regain control, the work may fall to the Joint Committee on Internal Revenue Taxation.

Memo on Renegotiation

A House Armed Services subcommittee has called for a restudy of the Renegotiation Act and the regulations and conduct of the Renegotiation Board. Chances of any such review are slim, at least until the act comes up for renewal (a two-year extension was just approved). Under the present setup, some contracts dating back to 1952 are being renegotiated. One reason is that the armed services put redetermination clauses in some purchase contracts, and the redetermination can take two to three years. The call for restudy came out of investigation of aircraft profits. The group reports profits aren't excessive but urges the services to consider putting a limit on how much executive pay and bonuses can be charged to the government as overhead.

Bureau of Mines To Boost Research

The Bureau of Mines is stepping up its research work. Included will be projects in: 1. Steelmaking—treatment of low-grade ores and smelting characteristics of various sizes and types of ores. 2. Re-evaluation of the supply-demand picture in aluminum, magnesium and titanium. 3. Studies aimed at bringing down the cost of high-purity titanium and a check of the quality and extent of U. S. titanium reserves. 4. Search for new sources of copper, lead and zinc ores, plus metallurgical research on all three metals, with copper due for some special attention. 5. New attention to columbium, tantalum, beryllium and selenium, plus increased work with the rare earths.

Coming: Economic Studies

Look for a late fall investigation of prices, wages and profits by the Joint Economic Committee. The steel industry is in line for the spotlight. A December hearing may also be scheduled on monetary policy and credit. A late fall date may be set for an inquiry by a special subcommittee on industrial migration.

Nibbles on Tin Smelter

The government is taking offers on its Texas City, Tex., tin smelter. Although some sources claim operating costs are too high for commercial purposes, more than a score of inquiries have been received. If the plant were used to make alloys or (with equipment revisions) to produce some other product, it might be able to pay its way. Priority will be given to buyers who would make tin-bearing products.

Meet Dr. U. T. Greene: His regular job is co-ordinator of Diamond Alkali Co.'s Commercial Development Department. For the next six months or so, he will serve as director of the Chemical & Rubber Division, Business & Defense Services Administration. He can be reached at the Commerce department, Sterling 3-9200, Room 4425.

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Bellows cover for sliding ways
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Custom-designed and engineered to fit mechanical giants or midgets

Whether you want a boot two stories high . . . or no bigger than your thumb . . . let C/R Sirvis engineers solve the problem for you. They're specialists . . . backed by 78 years' experience . . . with unusual skills and ingenuity in the development and manufacture of mechanical boots. They'll design and produce a C/R Sirvis boot to your exact requirements in any size, any quantity . . . using only the finest materials: mechanical leather, selected, tanned and treated by C/R . . . nylon . . . or elastomer-coated fabric. The absolute dependability of your boot will be proved before production.

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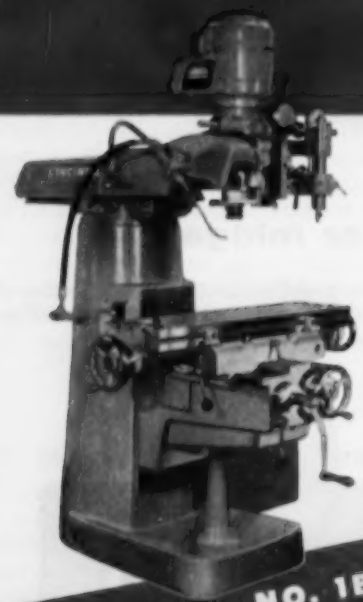

The Contourmaster Tool and Die Milling Machine developed by Cincinnati Milling is a member of the world's greatest family of hydraulic tracer controlled machine tools. The Contourmaster is built in two styles, 1A and 1B, differing primarily in table size and location of handwheels. Both styles are equipped with Cincinnati Automatic Hydraulic Depth Control, which operates from a few ounces of contact pressure . . . three-dimensional positioning of tracer mechanism . . . ram mounting of spindle carrier for increased cross range. Many cost-reducing features are combined in this great new CINCINNATI . . . the Contourmaster . . . master of all small- to medium-size tool and die work. Get the complete story by writing for catalog No. M-1919.

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MILLING MACHINES • CUTTER SHARPENING MACHINES • BROACHING MACHINES • METAL FORMING MACHINES • FLAME HARDENING MACHINES • OPTICAL PROJECTION PROFILE GRINDERS • CUTTING FLUID

19,000 Sellers for Hire

That's how many independent distributors and agents serve metalworking. Here are tips on how manufacturers can work better with them

Trouble Spots in Manufacturer-Seller Relations

(Survey of manufacturers who use distributors by American Supply & Machinery Manufacturers' Association)

	YES	NO
1. Do your salesmen complain of wasted time when calling with the distributors' salesmen?	114	96
a. Are such calls made at the request of distributor?	175	45
b. Are criticisms justified where arrangements have been made at the request of manufacturer?	76	89
c. Do your salesmen advise distributor salesmen as to time of call, etc., well in advance of call?	190	18
d. Do your men find it hard to get the distributors' salesmen out of the office in the morning?	98	99
2. Are you being requested to have your representatives spend time at distributors' exhibits or shows?	186	25
a. In most cases, do you consider this as time well spent?	184	24
b. Are you glad to be invited to participate in exhibits or shows sponsored by the distributors?	195	13
c. Do you look upon these occasions (from your standpoint) as an expensive obligation?	63	147
d. Do you supply exhibit material?	200	18
e. Do you ever contribute toward the cost of exhibit space?	68	147
3. Are you concerned about proper time allotted to your products at distributors' sales meetings?	132	68

a. How much time do you think should be allotted?
Range: 4 to 180 minutes *Average:* 61 minutes

b. What is most convenient time for these meetings?

	a.m.	p.m.
Monday	35	41
Tuesday	17	33
Wednesday	19	30
Thursday	15	32
Friday	17	74
Saturday	58	6

4. What per cent of your salesmen's time is used for making calls with distributors' salesmen?

Range: 1 to 100% *Average:* 32%

ABOUT A YEAR ago, C. B. Hoffman was wrestling with a problem that faces most sales managers sooner or later: "Should I go to independent sellers to move one of my products?"

The answer was "yes" for the sales vice president of Brush Electronics Co., Cleveland, a division of Clevite Corp. The conclusion was not unusual because some 19,000 independent sellers will move an estimated $9 billion worth of manufacturers' goods this year (products for other manufacturers' use, such as capital equipment and accessories, mill supplies and metal).

Different — While the decision was a common one, Brush's approach to implementing it was not. "We used marketing research to determine whether we would sell that way, and we employ the same technique in picking organizations to sell for us," says Mr. Hoffman.

The lack of a businesslike approach to the independent seller by the manufacturer who uses his services is probably a major cause of growing friction between the two, believe some observers. The independent seller complains of inadequate commissions, arbitrary cancellations of franchises, poor sales help on the part of the manufacturer. But the industrial man says some independent sellers cut prices; too few reinvest part of profits in their businesses; not enough provide for continuation of their enterprises in case the principals retire or become incapacitated.

Maze—One reason manufacturers have trouble working out an organized approach to the independent seller is the seemingly disorganized maze that meets him as he starts to study the field. Wholesalers of industrial supplies and equipment (often called mill suppliers) number more than 2000, but they range in character from the New York firm that stocks 53,000 different items to the specialist that has only three or four lines stocked. Then, there are an estimated 15,000 manufacturers' agents who don't stock anything, but are private businessmen acting as salesmen for manufacturers. To complicate things, some distributors act as agents on a

line or two, and some agents may stock one or two products and, thus, act as distributors part of the time. But that's not all—more than 1300 warehouses distribute metal, 240 firms distribute new machine tools, and on and on.

Not only the complexity of this method of distribution, but the sheer growth of it has confounded manufacturers. In these lush times, a supply house or an agent has sprung from beneath every bush. Even in machine tool distribution where high capitalization and great technical knowledge are required, the 125 in the business in 1939 have mushroomed to 240 now.

Money—Nor do all manufacturers realize the capital necessary for some types of distribution. Towmotor Corp., Cleveland, estimates that a typical distributor for its industrial trucks would need to spend some $250,000 for adequate sales and service facilities, if starting from scratch.

Maintenance service, too, is a problem in picking your independent seller. Some offer it, some don't.

Yes and No—It's well to know, also, what independent sellers can —and cannot—do. You can use them: 1. When your sales revenue is inadequate to support a direct sales force. 2. When you are introducing a new product. 3. When the customers are widely scattered. 4. When most buyers need only small quantities at a time.

But independent sellers cannot: 1. Devote full time to your products. 2. Be strictly under your control on pricing and other sales policies. 3. Sell for nothing (commission or discount rates vary widely but probably average around 20 or 25 per cent for distributors); sell anything to anybody (not much strip steel is sold by warehouses to GM).

The First Step — No wonder Brush started with a full-scale research job on how to sell its product, the Surfindicator to measure surface finish. It decided finally on industrial distributors with a small number of lines, primarily for three reasons: 1. It needed someone to stock and demonstrate its product, so an agent was unsuitable. 2. It needed sales concentration, so a general-line house was impractical. 3. It needed widespread sales effort, so a private sales force that would be adequate would also be uneconomical.

From its introduction in 1953 until the start of 1956, Brush sold the Surfindicator direct, as it did all its other lines. But results were so-so because the device had wider applications than most of Brush's highly specialized products. It needed broader coverage.

Find the Market — The company's first step was to define the market better. An advertising agency was hired to do that job. It came up with 35,000-40,000 names of potential users, people who needed to measure a surface finish. Brush wrote to those thousands asking for names of the man or men who bought such a product. The company ended up with some 28,000 names as a result of that action, plus a review of the names it already had on file. It took 20 per cent of those (which market surveys revealed did 80 per cent of the business) and decided to concentrate on them.

While that marketing detective work was being completed, the company also started its search for distributors. It knew who and where the biggest potential customers were. A buying-area map told it the cities where it probably should have distributors. Next it got the names of all industrial distributors in each area from various directories. Out of these names it segregated the best. Next, the advertising agency wrote to the promising ones, not mentioning Brush but generally describing the product. Finally the company sent a man to the territory to interview the best distributors that responded. From that interview came the final decision on which distributors to deal with.

Selling Job—In these days when a good distributor must be sold to take on a new line, Brush's list of potential customers in the area, together with the names of the person who usually did the buying, was a selling tool of high power. Brush started recruiting distributors at the start of 1956. It has 50 now and expects to have its goal of about 100 by the end of the year.

When you've made a good beginning in picking your distribu-

How Mill Supply Sales Have Grown

(Volume for wholesalers of industrial supplies and equipment)

1955	$3950 million
1950	$3190 million
1945	$2550 million
1940	$1200 million
1935	$800 million

Source: National and Southern Industrial Distributors' Associations

tor or agent, you're well started toward profitable relations with the organization—but just started. You must keep things going well. To do that you need a program to instruct your distributors in good business, sales and pricing management (see the accompanying checklist).

Business — The auto companies offer regular counseling in business management to dealers. Chrysler Corp. for example, has a periodic program whereby a few dealers at a time will get instruction by specialists in such problems as how to recruit and train salesmen, how to absorb overhead, how to use income that's available. Spot attention goes to individual problems. Often a dealer has no glaring faults, just a looseness in planning. Chrysler gives him a profit goal that provides him a track to run on. General Motors Corp. does the same thing. Among its recommendations is that dealers keep books in a standard accounting system.

A worry of many metalworking companies that use independent sellers is that the selling entity will collapse when the principal retires or is incapacitated. A Chicago component maker solves the problem with a three-year, in-plant training program for young men in sales, production and engineering. Six men a year complete the course and go with one of the distributors, well versed in the principal's products and policies. Distributors like the plan, want it expanded. Eventually, a trainee may succeed the distributor or go into partnership with him.

Another worry, especially for manufacturers with distributors, is that the dealer isn't reinvesting enough of his profit in the distributing business. C. E. Smith, Towmotor's president, suggests the answer to this one lies in a program of economic education for distributors, such as the auto companies practice. The Detroit firms make a case for why it's good business to spend money to make money.

Sales — Manufacturers have to take the initiative in marketing research. It's a rare distributor or agent who has the facilities to do it. Brush's program of defining the market and coupling that with a direct mail campaign giving the distributor's name is a godsend. Distributors, too, like national advertising which features the distributor, such as the program by Wickwire Spencer Steel Division of Colorado Fuel & Iron Corp.

Finally, sales training by the manufacturer is a must. The program of Boston Gear Works, Quincy, Mass., (STEEL, July 16, p. 86) has won wide acclaim from distributors.

Pricing—Today some marginal independent sellers are cutting prices to keep going. Many legitimate houses are tempted to meet these quotations. The result has been pricing chaos, unless a manufacturer has taken a tough attitude with every distributor caught price fighting.

A major economic problem today is how to distribute what we manufacture. The 19,000 independent sellers of manufacturers' goods offer one way, but their services can be used to better advantage by industry. Says Economist Peter Drucker: The first supplier who finds a better way to use our distribution system "will sweep the market."

• An extra copy of this article is available until supply is exhausted. Write Editorial Service, STEEL, Penton Bldg., Cleveland 13, O.

For More Profitable Relations with Independent Sellers . . .

I Offer Courses in Business Management:

1. To assure continuity in the selling organization.
2. To teach the value of reinvestment in facilities.
3. To show how standard accounting procedures can control costs.

II Practice Sales Management:

1. By putting your distributor policy in writing.
2. By giving sales training.
3. By offering a marketing service for your representatives.
4. By preparing adequate advertising, literature and catalog information.
5. By sending direct inquiries to your representatives for handling.
6. By granting selective, if not exclusive, representation.
7. By refraining from jumping erratically from one kind of sales method to another.
8. By helping with arrangements on time sales or leasing deals.

III Practice Pricing Management:

1. By being tough about price cutting.
2. By granting fair and consistent commissions or discounts.
3. By indicating the percentage of change when the selling price, cost and/or gross margin have been modified.

How Great Lakes Steel *molds* quality

As molten pig iron gushes from the world's largest blast furnace, a generous cupful is ladled out into small, trough-like molds.

Cooled and solidified, these "guinea pigs" (samples of the iron that goes into open-hearth steelmaking) are then rushed to Great Lakes quality control laboratories. For they hold a big chunk of the secret to producing steel that meets customer specifications *all down the line!*

They tell if the blast furnace burden is precisely balanced. They tell if as many impurities as possible have been eliminated. They help tell just what "seasoning" must be added to the open hearth charge, so every batch of steel has the desired chemical composition and drawing qualities—and no buts about it!

Quality control *every* step of the way! That's our job at Great Lakes Steel . . . that, and the kind of service you expect—*and get*—from just one phone call.

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LARGEST IN THE WORLD and first with a hearth diameter of over 30 feet, the No. 1 Blast Furnace is one of four at Great Lakes. Thanks to constant control, these furnaces produce iron that, beyond question, spells higher quality steel.

District Sales Offices: Boston, Chicago, Cincinnati, Cleveland, Grand Rapids, Houston, Indianapolis, Lansing, Los Angeles, New York City, Philadelphia, Pittsburgh, Rochester, St. Louis, San Francisco, Toledo, Toronto.

Fuel Injection on '58 Models?

High costs indicate it won't be on too many, but active engineering projects in several quarters may turn up improved versions. Stylists like it

FUEL injection, despite a rash of rumors, isn't scheduled for widespread introduction on '57 cars. Four and even eight-barreled carburetors with vapor cartridge air cleaners will be the intermediate step.

Sound economics dictate holding off on injection, at least until 1958. Engineers point out that no matter how much money is poured into carburetors, costs still won't equal those of precision-made injection boosters.

Compare—Dual carburetors may cost $35 to $40 as standard equipment (single carbs are as low as $5), but fuel injectors run $100 and up. Even mass production isn't likely to bring costs down to comfortable levels for several years.

Other sales points: A GM engineer says that one fuel injector under study gives only about a 10 per cent increase in fuel economy and boosts horsepower less than 25 per cent.

Advocates—Sports car owners and auto stylists have been beating the drum for fuel injection. The full throttle addicts applaud anything which boosts engine output and gives them fast pickup when they mash down on the gas pedal. Cost is no consideration.

Advertising agencies have touted stylists' claims that scrapping bulky air cleaner-carburetor units in favor of FI makes for lower silhouettes. This is true, but auto makers still aren't convinced that volume production of fuel injectors will pay off dollarwise.

Talkative—Nobody disputes the fact that fuel injection is practical from an engineering (but not cost) standpoint. But no auto company admits it is seriously investigating anything but better carburetion. Ford, however, has set up a fuel and carburetor lab to study fuel injection as well as standard carburetion methods.

Supplier companies are equally as cagey about commenting. All of them are working avidly to cook up a system which will satisfy styling studios and cost departments. American Bosch Arma Corp., Springfield, Mass., has just licensed Thompson Products Inc., Cleveland, to make and sell Bosch fuel injectors.

Hints — Holley Carburetor Co., Detroit, and Zenith Carburetor Division of Bendix Aviation Corp., also Detroit, have hot projects under way. The Bendix division hints at a big FI announcement this fall, probably October.

Bruce Multhaup, assistant to Thompson's vice president of engineering, discounts early introductions. He says some form of fuel injection may show up in 1958. Besides cost and curtailment of styling demands, it may well be that another holdup is the problem auto makers have of deciding which type is best.

Choice — There are at least a dozen basic fuel injection systems and probably several hundred variations. Most of them inject fuel directly into individual cylinders rather than sucking gasoline from a carburetor through a manifold and spraying it into the cylinders.

Results are reliable ignition, immediate response to throttle pressure and more complete combustion. Today's carburetor wastes gas because of haphazard air-fuel mixes in each cylinder.

Feeds—Most expensive injection units meter out each charge of fuel. Metered systems call for more parts, critical machining, delicate adjustments. Their high cost makes them an illogical choice for volume production and installation.

Constant flow injection depends on pressure pumps to shoot gas vapor into the cylinders. Operation largely is controlled by engine speed and manifold vacuum. Constant flow units aren't so complicated or expensive as metered layouts, but they don't work too well at low speeds.

Likely—If engineers can correct

A test driver points to the experimental fuel injection unit on a Mercury

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this fault, some constant flow injector system looks like the best bet for initial 1958 introduction. Also, it can better be adapted to existing engines.

A water spray system, which is supposed to provide good vapor mix, has been pretty much discounted as a serious threat. It's rumored, however, that Pontiac still is interested in the water injector setup.

Appearance—Meanwhile, it looks like Cadillac's Eldorado Brougham is the only car which might spring fuel injection this year. There's a bare possibility that the Chevrolet's Corvette, Ford's Thunderbird and Studebaker's Hawk might have it as an optional item later in the 1957 model run.

The Continental Mark II and even Mercury have been listed as suspects, but latest reports count them out. The rest of the industry is waiting for the price to drop or for stylists to pick up another winning hand.

Union Takes Aim

The UAW is cocking a careful eye at automotive tool and die shops which are using semi and unskilled workers to make up plastic dies and tooling.

The problem hasn't brought much noise yet, but look for union thunder as auto makers find more uses for some 700 plastic compounds in die and model work. Plastics already are gaining in short run stamping dies and checking fixtures.

There are separate classifications for plastic tool and die makers and for plastic model makers. Although it's a field in itself, steel tool and die men can make the switch with little additional training and (so far) no complaints from the union.

Discord — Trouble starts when semiskilled workers who make temporary plaster mockups and rough patterns are let loose with plastics. The plaster parts require little training to make. They're usually broken up. Plastic models and dies are kept permanently.

There's a minimum wage differential of some 80 cents between plaster workers and plastic and steel tool and die groups. The union claims that's not important. It's worried about skilled workers being forced out of a job.

In this high wage period and tight trained labor market, tool and die shops are having it rough enough. Union sniping won't help. Possible solution: Set up similar apprentice standards for steel and plastic workers. Apprentices can fill in where the need is greatest.

GM Employment High

General Motors Corp.'s worldwide operations had a good first half. Payroll and employment totals were second best only to those of last year's record first half.

Employment averaged 617,302; payrolls totaled $1441 million. In 1955's first half, employment was 624,954. Payrolls were $1563 million.

Most of the decline was caused by cutbacks in GM's U.S. auto plants during the second quarter.

GM points out that its employment in the U.S. has risen from 273,000 to 525,000 from 1946 to 1955. Since 1953, 55,000 defense jobs have been converted to civilian production.

The average number of hours worked in the first half of 1956 was 38.30. Weekly earnings averaged $92.06.

GM wage earners in the U.S. averaged 363,073 during the second quarter, down from 417,600 in the corresponding quarter of 1955.

U. S. Auto Output

Passenger Only

	1956	1955
January	612,079	659,508
February	555,596	675,495
March	575,234	794,015
April	547,766	753,851
May	471,533	724,892
June	430,141†	649,393
6 Mo. Total	3,192,349†	4,257,154
July		659,763
August		614,493
September		461,591
October		517,813
November		749,061
December		682,257
Total		7,942,132

Week Ended	1956	1955
June 23	105,243	151,249
June 30	103,037	158,402
July 7	68,110	134,092
July 14	112,361	167,473
July 21	113,710†	196,434
July 28	112,500*	199,788

Source: *Ward's Automotive Reports*
†Preliminary *Estimated by STEEL

Ford Divisions Consolidate

Continental and Lincoln have been grouped into a single division, reports L. D. Crusoe, executive vice president, Ford Motor Co., Dearborn, Mich.

"The consolidation will advance further the company's position in the fine car field," adds Mr. Crusoe.

Lincoln sales and production are highest in the industry, about 27 per cent ahead of last year's. Mark II's haven't fared so well. Only about 1000 of the luxury cars had been produced by mid-July.

Ford once hoped to make and sell 4000 units annually. Recent revisions have knocked that schedule down toward the 2500 mark.

Both cars will continue to be marketed through the Mercury sales organization for the rest of this year.

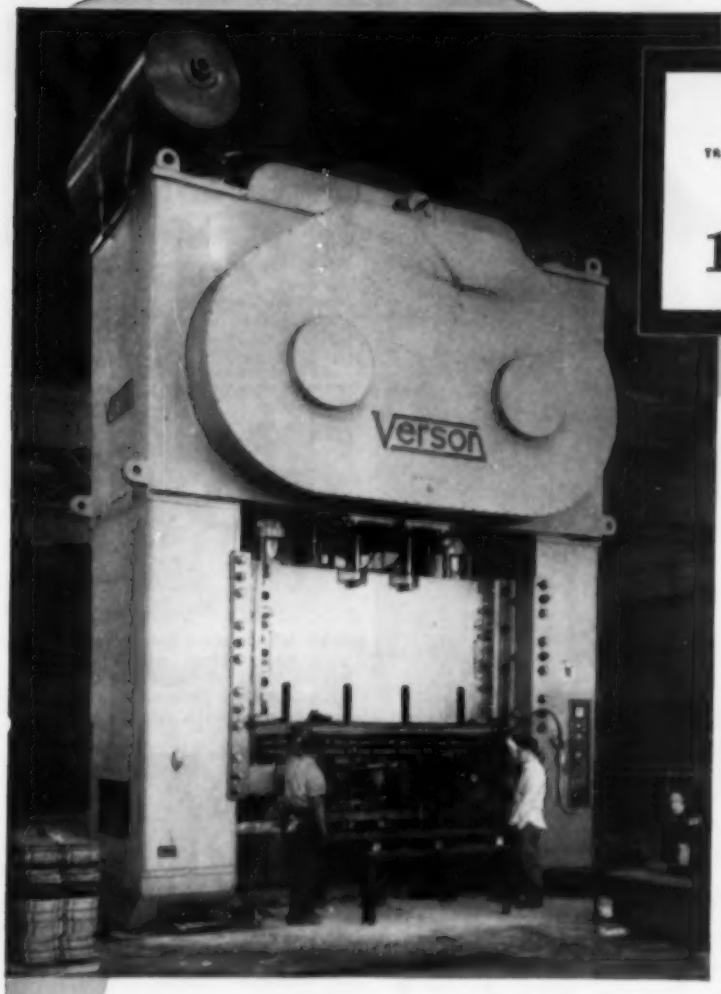
Exhaust Notes

- A carburetor laboratory for testing the flow of fuel and air in engines has been completed at Ford's research and engineering center in Dearborn, Mich. It also provides facilities for expanded fuel injection development. Also, evaluation tests can be made of manifolds, air cleaners and other parts of induction systems.
- Chrysler Corp. says it has set Aug. 1 as the recall deadline for almost 1000 part workers in its New Castle, Ind., forge plant and at its automatic transmission plant, Kokomo, Ind.
- General Motors and Chrysler indicate assembly lines will start shutting down this week and next for model change-overs. Ford earlier reported it would start change-overs this week. The smaller producers are expected to wait at least until mid-August.
- The Automobile Manufacturers Association has allotted exhibition spaces for the first National Automobile Show since 1940. The show will be held in New York City, Dec. 8-16.

Front to Back Crank Arrangement of this

TRADE **Verson** MARK

1800 Ton Press



eliminates need for extra long shaft

Verson Presses offer features that bring accuracy, dependability and economy to a wide range of metal forming operations. The Verson Allsteel Frame, anti-overlap clutch and brake unit, square type gibs and non-oscillating vertical type adjusting screw are examples of the engineering and design that are a part of every Verson Press.

The press illustrated is a Verson 1800 Ton, twin gear, double crank. Two crankshafts are arranged front to back to eliminate the necessity of an extra long crankshaft. Gearing for the press can be installed and removed through the front of the crown allowing installation in areas with low overhead clearance. The machine was built to J.I.C. standards and has all electrical wiring and equipment, lubrication piping, air piping and controls installed internally.

We will be pleased to recommend Verson Presses to fit your production process. Just send an outline of your requirements.

A Verson Press for every job from 60 tons up.

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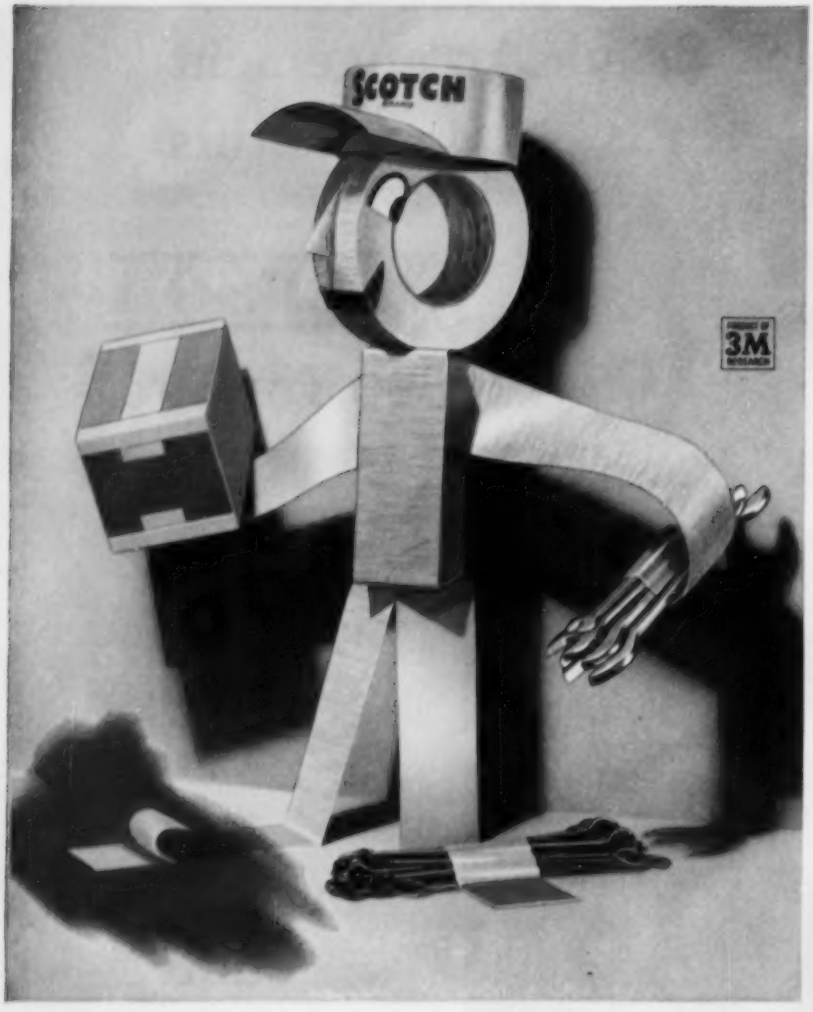

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"SCOTCH" Brand Masking Tape can do dozens of other jobs besides paint-masking: hold, bundle, seal, bind, band . . . these are but a few applications for these versatile tapes. The pressure-sensitive adhesives stick at a touch; both flat and creped backings available. Ask your tape distributor about "SCOTCH" Brand Masking Tapes. And remember, always specify "SCOTCH" Brand, the quality tape . . . and stick with it!

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MASK any size, any shape area before painting with "SCOTCH" Brand Masking Tape and Masking Paper. Tape's adhesive sticks tightly to prevent paint "bleeding" or creeping. Strips off clean . . . won't stain.

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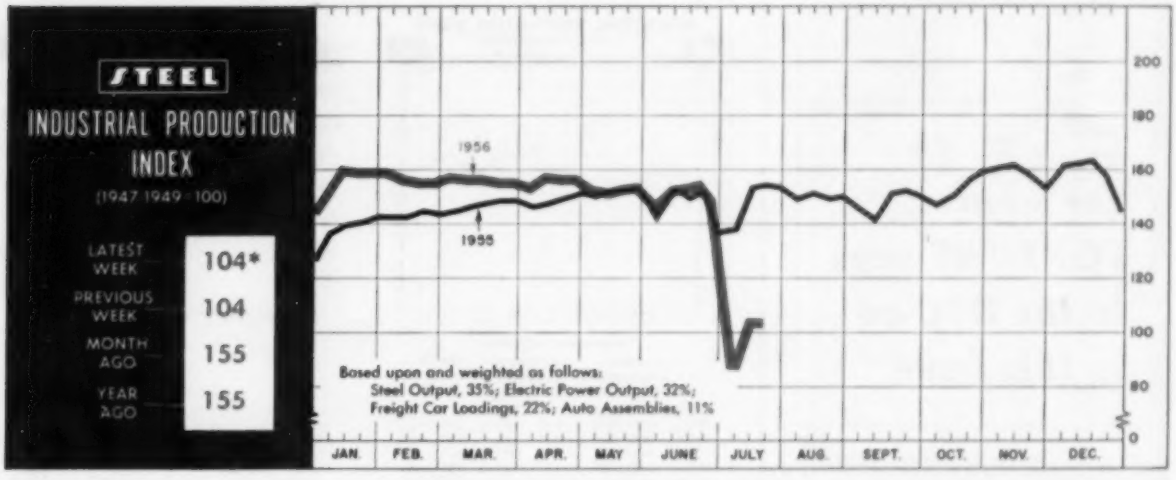

*Week ended July 21

Economy Stays Strong Despite Strike

BUSINESS DOES not roll over and play dead every time the nation experiences a major strike in one of its basic industries. Take a look at STEEL's industrial production index chart above for evidence.

In analyzing the impact of the steel strike on the nation's economy, the first week in July should be ignored or at least minimized. The July 4 holiday fell in the middle of the week this year, and some industries, such as automotive, shut down for as many as three days. A truer picture can be seen in the two following weeks, which recovered to 104 per cent of the 1947-1949 average.

Old Story — The strength which held the index close to all-time high levels for six months is preventing it from falling headlong to the strike depths predicted for it by some pessimistic economists. Foremost is the generation of electric energy. This is perhaps the broadest measure of the nation's economy in the index. Everybody uses electricity—both individuals and businesses. When many businesses are shut down or working partial shifts, this portion of the total will fall noticeably. When operations are at a high level, consumption of electricity will hold up, as is the case today.

Edison Electric Institute reports the weekly output is holding steady between 10.8 billion and 10.9 billion kw-hr. This is higher than the weekly level for most of 1955, a pretty good year in most books. It's on a par with weekly output in April, considered one of the best months of 1956. Some of this strength comes from the increased use of air conditioning equipment, but when you consider the cool weather the nation has had so far this summer, it must be agreed that industrial use has had a major role in maintaining the high level.

Less of a Load—Railroads are still shipping large volumes of industrial goods. Loadings for revenue totaled over 600,000 freight

BAROMETERS OF BUSINESS

	LATEST PERIOD*	PRIOR WEEK	YEAR AGO
INDUSTRY			
Steel Ingot Production (1000 net tons)[2]	385	377	2,190
Electric Power Distributed (million kw-hr)	10,800[1]	10,878	10,620
Bituminous Coal Output (1000 tons)	7,145[1]	1,240	9,730
Petroleum Production (daily avg—1000 bbl)	7,000[1]	7,084	6,650
Construction Volume (*ENR*—millions)	$391.3	$657.4	$360.7
Auto, Truck Output, U. S., Canada (*Ward's*)	147,111[1]	146,173	208,413
TRADE			
Freight Car Loadings (1000 cars)	652[1]	620	786
Business Failures (Dun & Bradstreet)	251	208	224
Currency in Circulation (millions)[3]	$30,808	$30,923	$30,287
Dept. Store Sales (changes from year ago)[3]	+2%	+3%	+4%
FINANCE			
Bank Clearings (Dun & Bradstreet, millions)	$22.396	$22,702	$21,369
Federal Gross Debt (billions)	$272.9	$273.0	$276.3
Bond Volume, NYSE (millions)	$18.4	$16.6	$19.3
Stocks Sales, NYSE (thousands of shares)	11,311	11,359	11,582
Loans and Investments (billions)[4]	$85.1	$85.5	$84.0
U. S. Govt. Obligations Held (billions)[4]	$26.3	$26.6	$31.7
PRICES			
STEEL's Finished Steel Price Index[5]	210.45	210.45	207.65
STEEL's Nonferrous Metal Price Index[6]	259.6	259.4	240.2
All Commodities[7]	114.1	113.9	110.0
Commodities Other Than Farm & Foods[7]	121.4	121.4	116.3

*Dates on request. [1]Preliminary. [2]Weekly capacities, net tons: 1956, 2,461,893; 1955, 2,413,278. [3]Federal Reserve Board. [4]Member banks, Federal Reserve System. [5]1935-1939=100. [6]1936-1939=100. [7]Bureau of Labor Statistics Index, 1947-1949=100

Says "Dependable Dan"—

See what FORTUNE says in the DSC ad in this issue

For helpful action

RELIANCE STEEL

DIV. DETROIT STEEL CORP.

General Office: Detroit 9, Mich.

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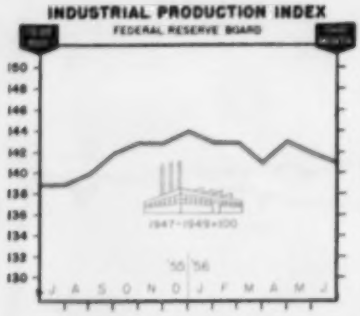
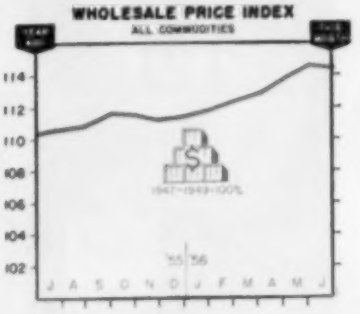




(seasonally adjusted)

	Total Production 1956	1955	Primary Metals 1956	1955	Metal Fabricating 1956	1955
Jan.	143	132	148	127	170	157
Feb.	143	133	148	131	168	157
Mar.	141	135	145	136	166	160
Apr.	143	136	145	138	171	160
May	142	138	142	140	167	163
June	141*	139	138*	143	167*	164
July	...	139	...	134	...	167
Aug.	...	140	...	139	...	170
Sept.	...	142	...	146	...	171
Oct.	...	143	...	148	...	173
Nov.	...	143	...	149	...	172
Dec.	...	144	...	151	...	172
Avg.	...	138	...	140	...	165

Federal Reserve Board. *Preliminary
Charts copyrighted, 1956, STEEL.

	1956	1955	1954
Jan.	111.9	110.1	110.9
Feb.	112.4	110.4	110.5
Mar.	112.8	110.0	110.5
Apr.	113.6	110.5	111.0
May	114.4	109.8	110.9
June	114.2	110.2	110.0
July	....	110.5	110.4
Aug.	....	110.9	110.5
Sept.	....	111.7	110.0
Oct.	....	111.6	109.7
Nov.	....	111.2	110.0
Dec.	....	111.4	109.5

U. S. Bureau of Labor Statistics
*Preliminary

cars in each of the two latest weeks, which was about 150,000 cars less than during the prestrike peak. Still, this is a drop of only about 18 per cent due to the steel strike itself. Coal loadings are running well ahead of year-ago figures now that the miners are back from their holiday. This component of the production index has dropped only about 4 or 5 percentage points as a result of the strike. It may drop farther if the strike continues much longer, but it will still lend a certain amount of strength to the index.

GNP Is Holding Up

Gross national product for the second quarter ran at annual rate of $408.5 billion, $5.1 billion above the previous record set in the first quarter of the year. How much effect will the steel strike have on the third quarter?

Even without a strike, the consensus was that the third quarter would be the lowest of the year. Now, best-informed estimates put this figure at $380 billion, if the strike is settled before the middle of August.

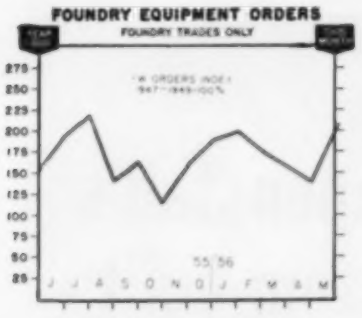
The strike is having surprisingly little effect on nonfarm employment, which continued at new highs in June. It's a safe bet that personal disposable income will stay at high levels. So far this year, average weekly earnings have risen an average of $3.29, paced by $7.64 gains in ordnance and $4 in primary metals and machinery.

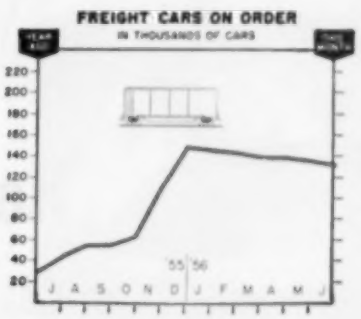
During the first quarter, much of this added income went into savings. The Securities & Exchange Commission reports that individuals saved over $5 billion, the second-highest saving rate on record. During the third quarter, it's likely that the added income will be spent on goods and services. Department store sales are turning up after a slow seasonal start; automobile inventories are being whittled down on schedule.

Profit Squeeze

But consumer selectivity is causing headaches for many manufacturers. Take appliances. TV shipments to dealers, for example, are off some 10 per cent from 1955's. During the first five months, 2.4 million sets were shipped, compared with 2.7 million last year.

Outlook in consumer durables for the remainder of the year is that over-all sales should stay up,





	1956	1955	1954
Jan.	195.6	81.0	173.8
Feb.	169.0	90.4	99.9
Mar.	152.7	163.6	82.7
Apr.	135.2	178.6	125.3
May	207.0	145.7	80.8
June	....	186.8	86.4
July	....	213.4	68.8
Aug.	....	134.0	75.6
Sept.	....	156.7	68.3
Oct.	....	108.6	147.5
Nov.	....	154.4	61.4
Dec.	....	183.9	113.9

Foundry Equipment Mfrs. Assn.

	Awards		Backlogs (end of month)	
	1956	1955	1956	1955
Jan.	1,818	5,087	144,946	18,395
Feb.	1,675	2,690	141,437	18,633
Mar.	1,618	2,154	137,070	17,974
Apr.	6,559	2,706	137,436	17,930
May	2,463	3,041	133,072	16,886
June	2,859	13,365	129,409	27,102
July	....	18,007	.....	42,888
Aug.	....	13,405	.....	52,803
Sept.	....	3,228	.....	52,913
Oct.	....	12,843	.....	61,954
Nov.	....	51,066	.....	109,370
Dec.	....	42,278	.....	147,320
Total	....	169,872		

American Railway Car Institute

but that competition will put an ever-increasing squeeze on profits. Says Westinghouse Electric Corp.'s John W. Craig, vice president and general manager of the electric appliance divisions: "Our second-quarter sales set a record, up from the like period of 1955 by 36.3 per cent. Over-all activity will continue at high levels, but some products, like electric ranges, will slow down." One reason for Westinghouse's second-quarter performance: Supply pipelines had to be refilled after the company's strike.

Spending Preview

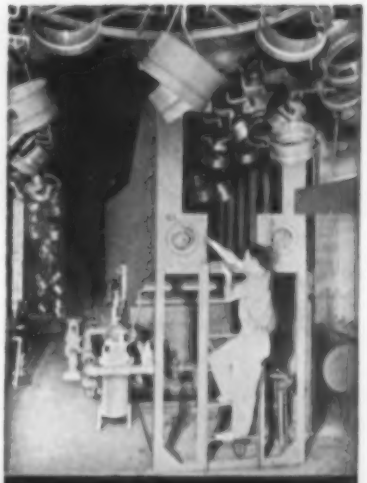
Outlook for heavy industry is less uncertain. First-half construction awards, says F. W. Dodge, made new records. Contracts will be translated into business through the first half of 1957. Sharpest gains were made in awards by manufacturing companies, which plan to spend 29 per cent more on new plant than they did last year.

Longer-term, an inside slant on what's ahead for capital spending is afforded by a survey of manufacturers in Massachusetts by the Federal Reserve Bank of Boston. Manufacturing companies there will boost expansion spending 40 per cent next year. Some of the biggest increases are planned by machinery, instrument, electrical machinery, chemical and primary metal industries.

Equipment Orders High

New plant and equipment spending is the main factor behind the strength of machinery industries. Foundry equipment, for example, is running 200 points ahead of last year (see chart above). Some of this gain is a direct result of the May foundry convention, when big orders were written.

Some sources in industry believe that May's gains were no flash in the pan. The situation is likened to that in the machine tool industry after its 1955 show. New orders have broken records in machine tools in almost every month since then. Like most equipment makers, foundry suppliers will not be affected directly by the steel strike unless capital spending is cut back. So far, there are no signs that the strike is altering plans. If new plant planning was sound before the strike, it will be doubly sound afterward. Higher raw materials prices will increase the need to cut costs.



SAVES $900 A WEEK

...new Cincinnati Finishing System at NuTone

This automatic painting and baking system, designed by CINCINNATI for NuTone, Inc., world-famous manufacturer of door chimes, ventilating fans and kitchen hoods, has increased production, sharply slashed finishing costs and doubled capacity per square foot area. Paint consumption is reduced to from 35 to 50% of what was formerly required.

Add to this a substantial increase in production, and you realize the higher efficiency NuTone has achieved, while saving more than $900 per week!

Let a CINCINNATI Cleaning and Finishing engineer take a look at your finishing costs. He'll give you a no-obligation analysis that can point to real savings for you.

Write today!

Cincinnati

THE CINCINNATI CLEANING AND FINISHING MACHINERY COMPANY

1019 Hageman St., Sharonville, Ohio, U.S.A.

Heppenstall's custom-built back-up roll sleeves...

work to your over-all cost advantage

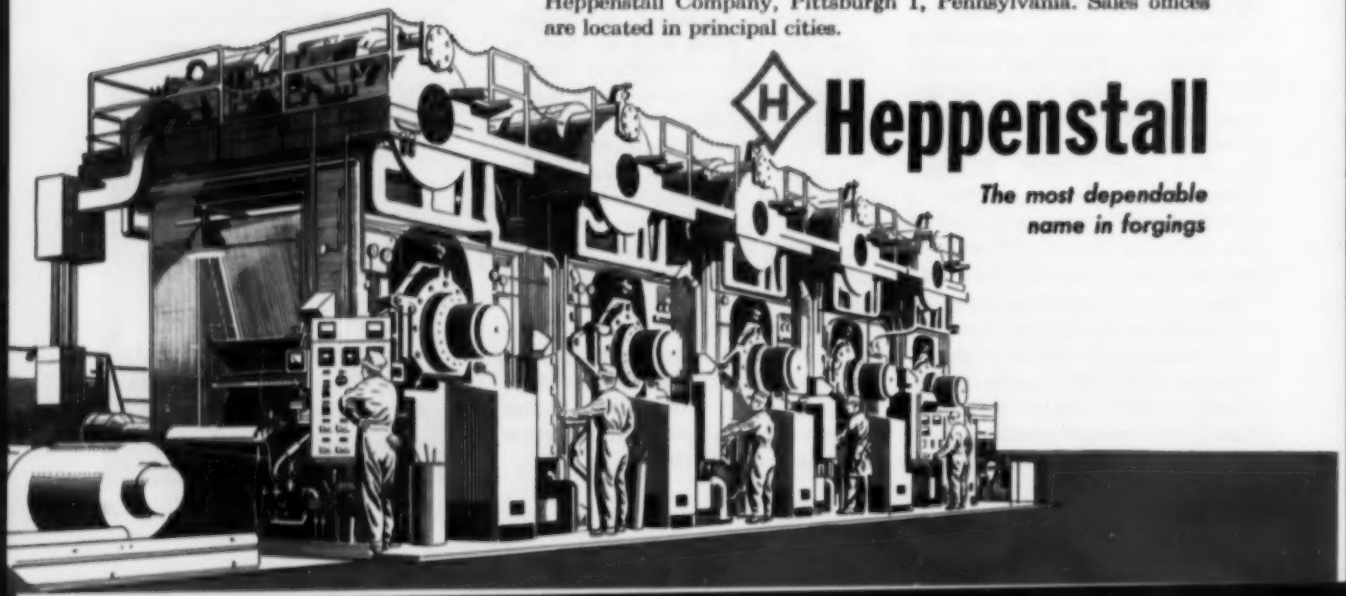
Heppenstall Back-Up Roll Sleeves enable you to roll record tonnages . . . decrease downtime . . . and effect over-all cost reduction. They give longer working life in today's high-speed mills because their up-to-the-minute design permits utilization of more effective forging and heat treating operations in their production. Each sleeve's working surface is *tempered to meet your exact hardness specification.*

These mandrel-forged sleeves—made from highest quality Heppenstall-produced alloy steel—are worked thoroughly under modern hydraulic presses to produce a finished product having both maximum density and grain refinement. In addition, they offer you exactness of fit and greater resistance to cracking and spalling during high-speed rolling.

All Heppenstall sleeves are fitted to extremely close tolerances which prevent circumferential slippage. Longitudinal movement is also eliminated because they are further locked in place by both a shoulder and Heppenstall's own patented locking ring.

Heppenstall also produces forged arbors . . . has facilities to grind both arbors and sleeves for perfect shrink-fitting.

For additional information and technical assistance, contact Heppenstall Company, Pittsburgh 1, Pennsylvania. Sales offices are located in principal cities.



Heppenstall

The most dependable name in forgings

HARRY W. BUCHANAN III
. . . Metal & Thermit sales post

Harry W. Buchanan III was named sales manager of chemicals, metals and plating products at **Metal & Thermit Corp.**, New York. **Henry Mahlstedt** was made product manager for plating products; **George Betz**, product manager for chemicals and metals; **Donald R. Meserve**, product manager for coatings.

Richard A. McBride was named executive vice president and general manager of the Milwaukee plant of **Crucible Steel Casting Co.**, division of Consolidated Foundries & Mfg. Corp. **Richard W. Krieg**, sales manager, was promoted to vice president-sales.

Hapman - Dutton Co. appointed **Lynn J. Riege** director of sales, Hapman Conveyors Division, Kalamazoo, Mich. He was manager, material handling engineering, with United States Gypsum Co.

Leonard J. Rogan was made quality control superintendent for **Carrier Corp.'s** Day & Night and Payne Divisions at Monrovia, Calif. He formerly was chief inspector for the systems and stamping departments at the Syracuse, N. Y., plant.

F. A. Stockwell was made assistant to the president of **Aro Equipment Corp.**, Bryan, O. **C. A. Stutzman** was named manager, lubricating equipment division.

WALKER G. DOLLMEYER
. . . Solar Aircraft v. p.-operations

Walker G. Dollmeyer was named to the new post of vice president-operations at **Solar Aircraft Co.**, San Diego, Calif. He was vice president-manufacturing at Toledo Scale Co.

Automatic Sprinkler Corp. of America, Youngstown, appointed **William E. O'Neill** sales manager to succeed **John J. Power Jr.** who is executive vice president.

Ohio Seamless Tube Division, Copperweld Steel Co., Shelby, O., appointed **Julius H. Clabaugh** assistant manager-operations; **Donald R. Chew**, quality control manager; **Francis S. Coleman**, chief engineer; and **George P. Jones**, assistant chief engineer.

John E. Meade was appointed director of engineering, electronics division, **American Machine & Foundry Co.**, at Boston. He was formerly associate superintendent of radar division, Naval Research Laboratories, Washington.

Trent Tube Co., East Troy, Wis., subsidiary of Crucible Steel Co. of America, appointed **R. K. Dickson** chief metallurgist; **Gilbert Olson**, assistant chief metallurgist; **G. L. Amrhein**, chief industrial engineer; and **F. J. Schiller**, plant engineer.

David G. Hillstrom was appointed sales manager, **Precision Steel Warehouse**, Chicago.

EARL F. HARRIS
. . . president of Rodney Hunt Machine

Earl F. Harris was elected president of **Rodney Hunt Machine Co.**, Orange, Mass. He became vice president in 1947 and executive vice president in 1952.

Harold E. Whiteley was elected executive vice president, **Geuder, Paeschke & Frey Co.**, Milwaukee. **Robert C. Colyer** was made vice president-sales; **Lester C. McKay**, vice president-engineering; **N. Martin Steffens**, vice president, Milwaukee plant; and **E. H. Thomas**, vice president, Lebanon, Ind., plant.

Hooker Stoughton was made manager, aircraft fastener section, closure division of **Scovill Mfg. Co.**, Waterbury, Conn.

W. H. Machin was named manager and **N. J. Schaffer**, factory superintendent of the new forging and screw machine division of **Scovill Mfg. Co.**, Waterbury, Conn.

H. S. Spaulding was made general staff metallurgist for **Kaiser Aluminum & Chemical Corp.'s** fabrication division, Oakland, Calif. **J. A. Ketchum** succeeds Mr. Spaulding as technical superintendent at Kaiser's rod, bar, wire and electrical conductor plant at Newark, O. Mr. Ketchum was chief metallurgist at Newark.

George R. Forbes Jr. was made manager, pipe department, **L. B. Foster Co.**, responsible for pro-

C. A. PAFENBACH
. . . Lavallee & Ide v. p.-sales

DWIGHT L. IMMEL
. . . Copperweld Steel gen. supt.

LEO M. MONROE
. . . Brush Electronics equip. sales mgr.

curement and sale of pipe in the New York territory.

C. A. Pafenbach was elected vice president-sales for **Lavallee & Ide,** Chicopee, Mass.

Arthur Berlin, former product engineer, positioning equipment division, Worthington Corp., joined **Unique Equipment Inc.,** Brooklyn, N. Y., as senior sales engineer.

William D. Huston was made manager of product development and research for **Rochester Mfg. Co.,** Rochester, N. Y.

Peninsular Steel Co., Detroit, elected **James H. Kurtz** president; **William I. Trader,** executive vice president; **R. J. Kurtz, F. W. Seyler** and **W. A. Kurtz,** vice presidents.

W. E. Phillips was named chairman and chief executive officer of **Massey-Harris-Ferguson Ltd.,** Toronto, Ont. He succeeds **J. S. Duncan,** who has severed association with the company.

David R. Prince was named district sales manager for the Cincinnati-Dayton, O., territory of **Fulton Sylphon Division,** Robertshaw-Fulton Controls Co. He succeeds **G. L. Leupold,** now assistant general sales manager of the division, located at Knoxville, Tenn.

Henry F. Castle was named manager of the Chicago branch office of **Colson Corp.**

Dwight L. Immel was named general superintendent of **Copperweld Steel Co.,** Warren, O. He succeeds **David G. Baxter,** retired. Mr. Immel was assistant general superintendent.

A. F. Skipp Jr. joined **Herr Equipment Corp.,** Warren, O., as sales engineer. He was with Westinghouse Electric Corp.

Fred Witzke was made manager of sales engineering and **Jack Kerrigan,** sales engineer at **Cleveland Instrument Co. Inc.,** Cleveland. Mr. Witzke was product supervisor, gaging equipment, at Brush Electronics Co.

Aluminum Co. of America's fabricating division appointed **T. F. McCormick** assistant chief metallurgist in Pittsburgh; **W. E. King,** chief development metallurgist, Pittsburgh; **K. B. Baker,** chief control metallurgist, Pittsburgh; and **A. M. Miller** chief metallurgist at Edgewater, N. J., Works to succeed Mr. Baker.

A. B. Crossno was made division tubular manager for **National Supply Co.'s** northwest division in Denver.

Thomas A. Kelly was elected executive vice president, **La Salle Steel Co.,** Hammond, Ind. He was vice president and treasurer.

Herbert P. Strack Jr. was made East Coast regional manager for **Coles Cranes Inc.,** Joliet, Ill.

Leo M. Monroe was made manager of industrial equipment sales at **Brush Electronics Co.,** Cleveland. He was an industrial sales engineer with Celotex Corp.

Capt. H. T. Dietrich, USN, ret., joined **Kaman Aircraft Corp.,** Bloomfield, Conn., as assistant to the president.

Peter R. Rentschler was elected secretary of **Hamilton Foundry & Machine Co.,** Hamilton, O., and of **Decatur Casting Co.,** Decatur, Ind.

Robert A. Reese was made Syracuse, N. Y., district sales manager for **Standard Pressed Steel Co. Edward D. Otto** was added to the Syracuse sales staff.

Emory W. Bell was made a project engineer with the rolling mill division of **E. W. Bliss Co.** at Salem, O. He was with Westinghouse Electric Corp.

John Wallerius was made chief engineer, **Lindberg Industrial Corp.,** Chicago. He was president of Sigma-Metallurgical Engineering Co. Inc.

Dr. Leonard Scribner returned to **Fansteel Metallurgical Corp.,** North Chicago, Ill., as assistant manager, metals and chemicals division. He was with Crane Co.

Cleco Air Tool Division, Reed Roller Bit Co., Houston, appointed **George Bush** division manager, south-central sales. He replaces

Hi-Qua-Led...A NEW STEEL MATERIAL

Addition of Lead to Steel for Circular Forgings Lends Cost-Reducing Machinability Without Changing Basic Steel Properties

Since the late 1930's steel manufacturers have searched for a satisfactory method of adding lead to steel for use in circular forgings. Large segregates of lead have been the most important problems to be solved. Now, however, ALCO Products, Inc. has developed a new process which overcomes this obstacle by distributing the lead evenly throughout the steel in a finely disseminated state. It is being marketed under the trade name, "Hi-Qua-Led Steel," in ALCO's rolled forgings, rings and gear blanks.

Development of Hi-Qua-Led

ALCO, in 1954, began a search for a lead-addition method that would cover the entire size range of the company's forged rings and gear blanks – up to 145-inch OD. After initial trials, ingots were produced from 12-in. to 36-in. diameter with lead recoveries as high as 85 per cent. When the ingot sections were forged and rolled into rings, the rings were sectioned and studied for segregation, impact, bend, tensile and other properties. They were uniformly good and lead was distributed as submicroscopic particles. Both ingot and forging sections were completely free of lead segregates. On the basis of these tests, ALCO applied for patents on its lead-addition method.

Advantages in Machinability

Hi-Qua-Led is designed to lower costs in the expensive machining of circular forgings. The lead additive in Hi-Qua-Led Steel acts as a lubricant for the cutting action of the tool, and provides faster removal of metal through heavier cuts and faster speeds. The lead reduces friction to a point where heat is minimized in the section being machined. Tools last longer before redressing or replacement. Some machines, too, can be upgraded through the use of Hi-Qua-Led because their present horsepower will perform cuts that were impossible before. On all machines, Hi-Qua-Led can reduce necessary power output and lower machine wear and tear. In cases where labor and machine time is expensive, machines operating at the same power output cut Hi-Qua-Led faster and deeper.

Hi-Qua-Led STEEL

Trade-mark Reg. applied for

Patent applied for on lead-addition method

Steel Properties Unchanged

ALCO has studied ingots in grades 1015, 1029, 1040, 1050, 1070, 4140, 4150 and 4340 steel, with lead added, and the lead distribution pattern has been unchanged. Customer tests for standard physical-property data and response to carburizing, induction-hardening and flame-hardening have shown that Hi-Qua-Led responds to heat treatment in the same manner as non-leaded steels. Fatigue tests of the reverse-bending type show no difference between Hi-Qua-Led and regular steel heat-treated to 145,000 lb per sq in. tensile.

Use of Hi-Qua-Led Forgings

Hi-Qua-Led circular forgings have a wide application in machining operations where a great deal of metal must be removed, where a very smooth surface finish is desired at low cost, in gear-cutting operations, or almost any milling, drilling or boring application. Threading, planing, shaping and hobbing are also more easily accomplished with Hi-Qua-Led steel forgings.

Hi-Qua-Led may be obtained in any size ALCO forged ring. An extensive inventory of Hi-Qua-Led ingots in many grades is already maintained at the Latrobe, Pa. forging plant. ALCO offices in Atlanta, Beaumont, Chicago, Cleveland, Houston, Kansas City, Los Angeles, New York, Pittsburgh, St. Louis, St. Paul, San Francisco, Schenectady, Tulsa and Washington have complete information. Or, if you wish, send the coupon for a brochure that gives Hi-Qua-Led details.

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. . . Russell, Burdsall & Ward p. e.

E. W. Clayton, now Cleco sales development manager.

E. C. Row was named administrative vice president of **Chrysler Corp.,** Detroit. He was president of Chrysler Corp. of Canada and recently was made president of the company's export division. He relinquishes both posts. **W. C. Newberg** was assigned to the new post of group vice president-automotive; and **R. S. Bright** to the new post of group vice president-basic manufacturing. **M. C. Patterson** was named president of Dodge Division to succeed Mr. Newberg. **Charles B. Gorey Jr.** was made director, manufacturing staff; and **Emlyn Lloyd,** director of purchasing.

Elliott E. Brainhard was elected executive vice president, **American Pipe & Construction Co.,** Los Angeles.

Peter C. Prior was elected treasurer and general manager of **Smith - Armstrong Forge Inc.,** Cleveland.

David Matter joined **Ohio Ferro-Alloys Corp.,** Canton, O., as manager of iron foundry service. He was foundry research metallurgist, manufacturing research division, International Harvester Co.

Dr. Philip P. Anderson joined **Carrier Corp.,** Syracuse, N. Y., as director of development in adsorption refrigeration, central research and development division. He was director of advanced engineering at Servel Inc.

Harry F. Barr was made chief engineer, **Chevrolet Motor Division,** General Motors Corp., Detroit. **E. N. Cole** was made general manager. **E. J. Premo** was made executive assistant chief engineer.

Charles R. C. Steers was named purchasing agent, **Russell, Burdsall & Ward Bolt and Nut Co.,** Port Chester, N. Y. He succeeds **P. M. Culyer,** retired.

Sam Redrow Jr. was elected secretary of **Cincinnati Milling Machine Co.,** Cincinnati, to succeed **Philip H. Cone,** resigned. **F. V. Geier Jr.** was named assistant secretary.

J. Davidge Warfield joined **Morse Chain Co.,** Ithaca, N. Y., as administrative assistant to the president. He was assistant to the president of Borg-Warner Corp., parent company.

Jack Keyes was elected vice president in charge of western Michigan sales for **Wagner Bros. Inc.,** Detroit. **Richard Watson** was made manager of a new sales office opened at 2417 Eastern Ave. S. E., Grand Rapids, Mich.

OBITUARIES . . .

Joseph K. Bole Jr., 50, assistant sales manager, bolt and chain division, **Republic Steel Corp.,** Cleveland, died July 19.

Roy E. Kinsey, 66, purchasing agent, **S. B. Whistler & Sons,** Buffalo, died July 14.

Gerald Frink, 80, president of **Washington Iron Works;** also **Stetson-Ross Machinery Co.,** Seattle, died July 10.

Norvill J. Breitweg, 55, in charge of production control, **Brush Electronics Division,** Clevite Corp., Cleveland, died July 17.

W. B. Peirce, 78, past president, **American Society of Tool Engineers,** died in Pittsburgh July 4.

Anthony Taddeo, 66, founder and president, **T. T. Bearing Co.,** Rochester, N. Y., died July 10.

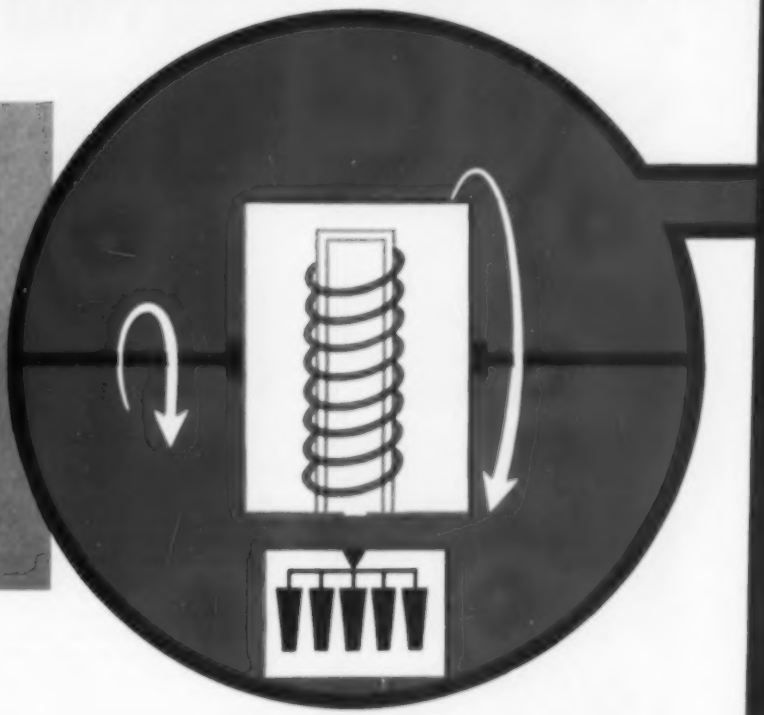
John J. Meriwether, 66, chief metallurgist, **Roria Tool & Die Co.,** San Diego, Calif, died July 10.

George Roberts, sales manager, **Birmingham Tank Co.,** Birmingham, died July 13.

Addison F. Wardwell, 80, president, **Carthage Machine Co.,** Watertown, N. Y., died July 7.

Frederick W. Kuss, 67, purchasing agent, **Burnham Corp.,** Irvington, N. Y., died July 19.

design with austenal in mind



New **VACUUM MELTING** *techniques being developed by* **MICROCAST** *give promise of higher performance parts for the future*

Austenal vacuum melting and casting techniques being currently developed may have a big place in your future designs.

Vacuum melting promises greatly improved investment castings and a wider range of cast parts, because it makes available alloys with outstanding high temperature properties. By removing harmful gases and holding down objectionable oxide inclusions, vacuum melting results in parts that are more ductile, stronger and tougher than before. Vacuum melting makes possible the use of alloys that were formerly uncastable.

For instance, these new Austenal techniques are already being studied for aircraft manufacturers on a development basis. Vacuum melting has helped furnish extremely high quality vanes and blades for future jet engines.

Discuss this new Austenal development with your Austenal representative. Vacuum melting may be the way for you to obtain higher performance in designing parts for tough jobs of the future.

---It's **NEW** *from Austenal*

Vacuum casting of turbine buckets such as this has been accomplished and the application of this method is being planned for other jet engine components.

austenal

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microcast division

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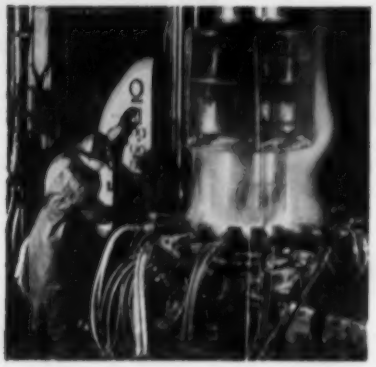

You need MORE than these to Heat Treat Metals!

The science of heat treating has become of vital importance to many manufacturing operations. Without the radical improvements of the properties and characteristics achieved in metals and alloys by heat treating, many of the nation's most important products could not be made.

To perform the appropriate type of heat treatment, such as annealing, normalizing, quenching, tempering, carburizing, controlled atmosphere hardening, stress relieving and others requires specialized, intricate, and expensive equipment such as is illustrated here.

But *more* than such equipment is needed. The most modern and highly specialized equipment is useless without the correct combination of operational skill and technical experience that has been developed over years of practical operating practice. Equipment and materials are important, but the *essential* factor in heat treating operations of all kinds is the human touch and the practiced hand.

The members of the Metal Treating Institute listed here are the recognized leaders of the commercial heat treating industry. They are specialists possessing the equipment, the technical skill, the years of experience, and the personnel with which to solve your heat treating problems all under one roof.

When you need complete heat treating services or want consultation concerning heat treating or engineering or design problems, write any of the companies listed. All inquiries will receive prompt attention.

WRITE FOR A COPY OF A BOOKLET "A REVIEW OF SALT BATH CARBURIZING".

THERE'S A HEAT TREATING SPECIALIST NEAR YOUR PLANT

Allied Metal Treating Corp.
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Elizabeth, N. J.
Anderson Steel Treating Co.
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B. & W. Precision Heat Treating Co.
Kitchener, Ontario, Canada
Benedict-Miller, Inc.
Lyndhurst, New Jersey
Bennett Heat Treating Co., Inc.
Newark 3, New Jersey
Commercial Metal Treating, Inc.
Bridgeport, Conn.
Cook Heat Treating Co. of Texas
Houston 11, Texas
The Dayton Forging & Heat Treating Co.
Dayton 3, Ohio
Dominy Heat Treating Corp.
Dallas, Texas
Drever Company
Philadelphia 33, Pennsylvania
Greenman Steel Treating Company
Worcester 5, Massachusetts

MTI MASTER CRAFTSMEN METAL TREATING INSTITUTE

Fred Heinzelman & Sons
New York 12, New York
Alfred Heller Heat Treating Co.
New York 38, New York
Hollywood Heat Treating Co.
Los Angeles 38, California
L-R Heat Treating Company
Newark, New Jersey
The Lakeside Steel Improvement Co.
Cleveland 14, Ohio
Metallurgical, Inc.
Minneapolis 14, Minnesota
Metallurgical, Inc.
Kansas City 8, Missouri

Metlab Company
Philadelphia 18, Pennsylvania
New England Metallurgical Corp.
South Boston 27, Massachusetts
Paulo Products Company
St. Louis 10, Missouri
Pittsburgh Commercial Heat Treating Co.
Pittsburgh 1, Pennsylvania
The Queen City Steel Treating Co.
Cincinnati 25, Ohio
J. W. Rex Company
Lansdale, Pennsylvania
Stanley P. Rockwell Company
Hartford 12, Connecticut
C. U. Scott & Son, Inc.
(Stainless Steels)
Rock Island, Illinois
Standard Steel Treating Co.
Detroit 10, Michigan
Syracuse Heat Treating Corp.
Syracuse, New York
Winton Heat Treating Company
Cleveland 16, Ohio

This advertisement sponsored by these Companies which are members of the Metal Treating Institute.

METAL TREATING INSTITUTE

271 NORTH AVENUE
NEW ROCHELLE, NEW YORK

Speeds Diecasting

Doehler-Jarvis cuts nonproductive time several hours by unique interchange of machines

DOEHLER-JARVIS Division of National Lead Co., New York, is operating its new diecasting plant in Stowe township, just outside of Pottstown, Pa. This facility complements the other Doehler-Jarvis plant located in Pottstown and which has been in operation since 1924.

From metal ingot to die-cast pieces packed in cases and ready for shipment, all in the same day —that sums up the activity of the new plant.

"Trolley" System—Physical setup of the casting machines is unique. Each machine is anchored at its working location on "trolley" tracks. When an order for diecastings is completed and the respective casting die must be dismounted from the casting machine, all lines supplying electric power, hydraulic pressure and water are quickly disconnected. A track-guided trolley building which runs the entire length of the building then comes alongside and lines up its own tracks with those of the diecasting machine. The machine is power-pulled into the trolley building and sped to the service area.

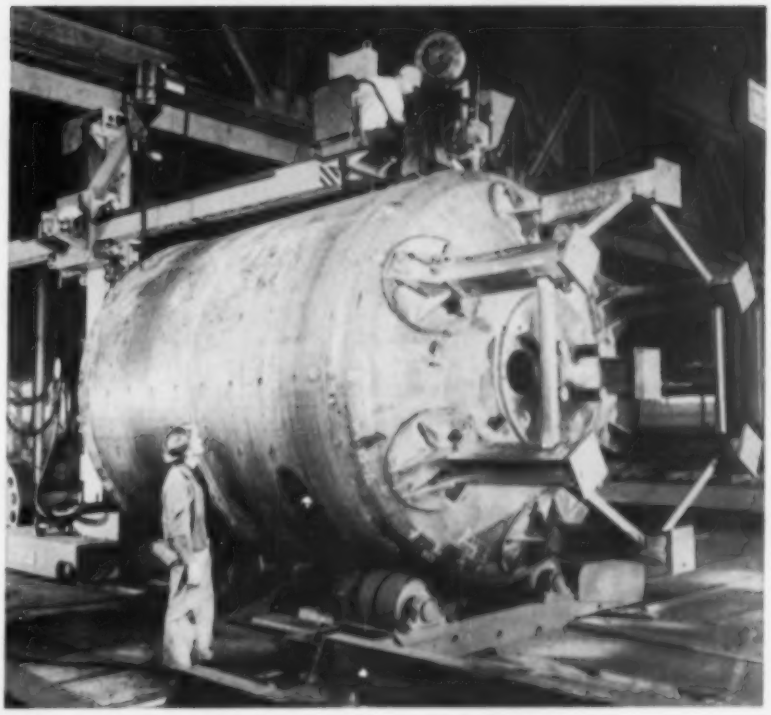
Meanwhile, another machine, already preheated and with another die for a different casting, is taken to replace the machine which has been withdrawn. The machine which has been withdrawn is then serviced and another die is mounted in place and made ready for the next interchange of machines.

Hours Saved—At the end of a production run, the time involved to dismount one die and to mount another normally consumes from a few hours time to 15 to 20 hours. Therefore, this feature of machine interchange reduces the lapse of time of nonproductive hours to a matter of 20 or 30 minutes at the new plant.

To force molten metal into the steel dies, hydraulic pressure of 1275 psi is used. The pressure is created by centrifugal hydraulic pumps.

Operations of the plant, which turns out aluminum diecastings, are on a straight line basis.

Frank J. Koegler, vice president of National Lead Co. and general manager of the Doehler-Jarvis Division, says: "This plant represents a $5-million experiment in human engineering as well as product engineering—and it works fine."



Giant Automatic Welder Proves Its Efficiency

Fabrication of large equipment at Dravo Corp.'s Pittsburgh plant is done economically in a giant automatic welder. Operator (shown at the top) is welding a viscose blender of 8000 gal capacity. His station is on the boom which carries the welding electrode. This permits constant inspection of welding action as the piece is rotated beneath the tip on power driven rolls. Time lost in shifting such heavy work pieces for normal down-hand welding is eliminated

Renames Carboloy Department

General Electric Co. changed the name of its Carboloy Department to Metallurgical Products Department, Detroit.

Opens Can Plant in Oregon

American Can Co., New York, started operations last month at its new plant in Salem, Oreg. J. G. Griffin is manager of the plant which will have an annual rated capacity of 240 million containers.

Fastener Maker Expands

Elastic Stop Nut Corp. of America, maker of self-locking fasteners, Union, N. J., completed construction of a 10,000-sq-ft addition to its building No. 2. It provides additional warehousing and shipping facilities.

Enters Atomic Energy Field

Superior Tube Co., Norristown, Pa., formally entered the fast-growing atomic energy industry through creation of a Nuclear Products Division. Headed by John B. Giacobbe, former Superior plant metallurgist, as director, and occupying plant facilities in Trappe and Phoenixville, Pa., the division fabricates subassemblies and components used in the cores of nuclear power reactors. Integrated with this division is Superior's Mechanical Development Division, an engineering facility headed by H. W. Cooper as director. In addition to reactive

(*Please turn to page 80*)

CONTINENTAL high-speed 21"x53"x60", 4-stand tandem cold mill in the Gibraltar Plant of the McLouth Steel Corporation.

CASTINGS—carbon and alloy steel castings from 20 to 250,000 pounds.

WELDMENTS—fabricated steel plate, or cast-weld design.

BLAW-KNOX
makes what it takes to cold roll at high speeds

In the Gibraltar Plant of McLouth Steel, this modern CONTINENTAL 60-inch, 4-stand tandem cold mill rolls steel at delivery speeds in excess of 3,000 fpm.

Designed to meet specific customer requirements, the mill has interesting features, such as—(1) entry and delivery coil conveyors of this cold strip mill, and two single-stand skin-pass mills, are at floor level—which provides greater safety, more efficient handling and easy inspection of all coils during processing. (2) mill equipment has built-in raceways to carry the electrical cables—which simplified the installation and provides easy access for maintenance.

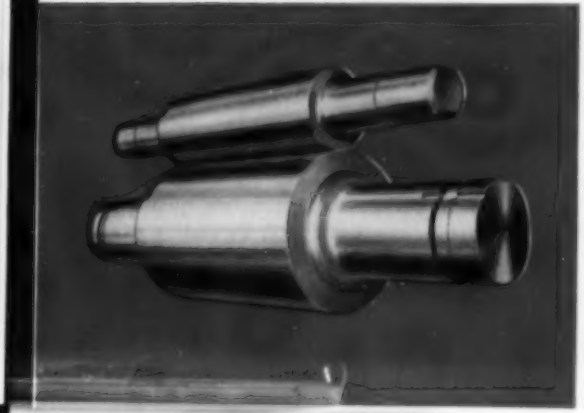
BLAW-KNOX designs and builds *complete* rolling mill installations—assumes undivided responsibility from preliminary engineering to satisfactory operation. At any time we'll be glad to discuss your plans with you.

BLAW-KNOX COMPANY
Foundry and Mill Machinery Division
Blaw-Knox Building • 300 Sixth Avenue
Pittsburgh 22, Pennsylvania

Complete Rolling Mill Installations . . . Including all auxiliary equipment . . . for ferrous and non-ferrous metals

Hot strip mills • cold strip mills • slabbing mills • temper mills • universal mills • plate mills • blooming mills • structural mills • rail mills • billet mills • rod mills • merchant mills . . . roll lathes • chippers • special machinery • and complete auxiliary equipment.

ROLLS—Iron, alloy iron and steel rolls for all types of rolling mills.



50th Anniversary
BLAW-KNOX
1906-1956

Extra Reach with Precision Touch
New ½-Yd., 9-Ton H-5 Hydrocrane

Here the new H-5 Hydrocrane handles 5-ton foundry flasks in the yard of a large industrial concern. Every crane function fully hydraulic powered and controlled. Available with clamshell, crane hook, magnet. Optional remote control of truck from crane cab.

BUCYRUS ERIE HYDROCRANE

The Bucyrus-Erie H-5 Hydrocrane combines 50 feet of boom reach, plus a 20-ft. jib extension, with all the work advantages of smooth, precise, hydraulic control, all the travel advantages of a conventional motor truck. In addition, the boom extends or retracts hydraulically within a 12-ft. range — while the crane is working. With this machine you can move equipment and supplies, handle bulk materials, maneuver in close quarters, with a smoothness and safety never before possible in the 50-ft. boom range.

New Flexibility, New Travel-Ability

Patented outriggers permit you to mount crane on a new or used commercial truck *of your choice*. You can select a heavy tandem truck for heavy-duty work or a lighter truck for fast around-the-plant travel. Both the high-lift 50-ft. boom and the standard 36-ft. boom retract to 25 feet for travel. Maximum over-all length, depending on truck, is under 35 feet.

Find out how the new H-5 Hydrocrane can speed your material handling jobs. Write today for new literature or see your Bucyrus-Erie distributor for a demonstration.

137H56

BUCYRUS-ERIE COMPANY
South Milwaukee, Wisconsin

(*Concluded from page 77*)

metals (titanium and zirconium alloys), the division will process stainless steels, high nickel alloys and rare metals having special nuclear properties.

Ryerson Builds in Spokane

Joseph T. Ryerson & Son Inc., Chicago, is erecting an office building at its Spokane, Wash., steel service plant. It will contain about 4500 sq ft of space, releasing former office space for conversion to warehouse area.

Foote Mineral Enlarges Plant

Foote Mineral Co., Philadelphia, will expand production facilities at its Electromanganese Division, Knoxville, Tenn. The project, expected to cost about $2 million, affects the firm's Lorraine street plant.

Sells Railroad Supply Line

Western Railroad Supply Co., Chicago, purchased the railroad supply business of Allis-Chalmers Mfg. Co.'s Buda Division. Products to be manufactured and sold by the new owner are: Complete line of jacks, car and locomotive replacers, track liners, bumping posts, car stops, rail and bonding drills, universal diesel nozzle testers. WRRS is expanding its offices and plant to accommodate the acquisition of the Buda business.

The remainder of Buda Division's products (gasoline and diesel engines, material handling and earth boring equipment) will continue to be manufactured at the Harvey, Ill., plant.

J&L Broadens Iron Ore Search

Search for additional reserves of iron ore has been extended by Jones & Laughlin Steel Corp. to lands it has optioned in Ashland county, Wisconsin. Decision to option the 1600 acres near Butternut and in the township of Agenda and to explore for iron ore was reached after preliminary geophysical surveys indicated the possible presence of economic quantities of magnetic iron formation or taconite which might be recovered by open pit mining. Another J&L

NOW! from the world's largest horizontal steel extrusion press...

SEAMLESS

HEAVY WALL PIPE

from any ferrous alloy

Now heavy wall pipe can be extruded from any ferrous alloy – in lengths up to 50 feet or more, with O.D.'s from 4″ to 22″, and with virtually no restriction on wall thickness.

The giant Curtiss-Wright horizontal extrusion press, now operating at the Metals Processing Division, *moves* the metal instead of *removing* it, for pipe of maximum length – and strength.

If your application calls for higher heat, corrosion and/or abrasion resistance – in pipe of highest tensile and yield strengths – Metals Processing Division is geared to fill the requirement. Complete facilities for handling any ferrous alloy, including the stainless series, as well as titanium and other reactive metals, are available to the chemical, petroleum, power and other key industries.

Take advantage of this new, aggressive facility for your pipe requirements. Write, wire or telephone for detailed information or engineering consultation today. Our field engineers are at your service.

METALS PROCESSING DIVISION

CURTISS-WRIGHT CW

CORPORATION • BUFFALO, NEW YORK

80 GRIDER STREET, BUFFALO, NEW YORK

They may Seem the same, but...

American is the name!

However you calculate it, your true fastener cost contains four things:

1. price **3. quality**
2. service **4. research**

Occasionally, you may find local price differentials you think may be worth your while. But no one gives you more of all four than American.

AMERICAN GIVES YOU MORE OF ALL FOUR

In service, with a tightly-knit system that meets the needs of the most intricate production lines. Like an appliance manufacturer who uses 120 million American Phillips fasteners a year.

In quality, with a unique quality control program that includes such protection for you as statistical sampling on production runs.

In research, which produced not only the Phillips Head fastener, but showed one customer a substantial saving by converting a three-part, assembled machine screw into a single cold-headed unit.

There are many sources of Phillips-type fasteners. But only at American will you find more of the four basic features you want — price, service, quality, research.

Make your own comparisons . . . send us your inquiry for price and delivery or your specifications for special fasteners. Write:

American!

AMERICAN SCREW CO. • WILLIMANTIC, CONN.
NORRISTOWN, PA. • CHICAGO, ILL. • DETROIT, MICHIGAN

exploratory site is in the province of Quebec, 200 miles north of the iron ore port of Seven Islands and 40 miles from the Quebec, North Shore & Labrador Railway.

Driver Opens Cleveland Branch

Wilbur B. Driver Co., Newark, N. J., opened a warehouse and branch office at 13701 Enterprise Ave., Cleveland 11, O.

Wales-Strippit Changes Hands

Houdaille Industries Inc., Buffalo, purchased Wales-Strippit Corp., North Tonawanda, N. Y., maker of interchangeable punching tools and a line of specialized machine tools for working sheet metal. The product lines will be expanded by Houdaille.

Alabama Pipe Closes Plant

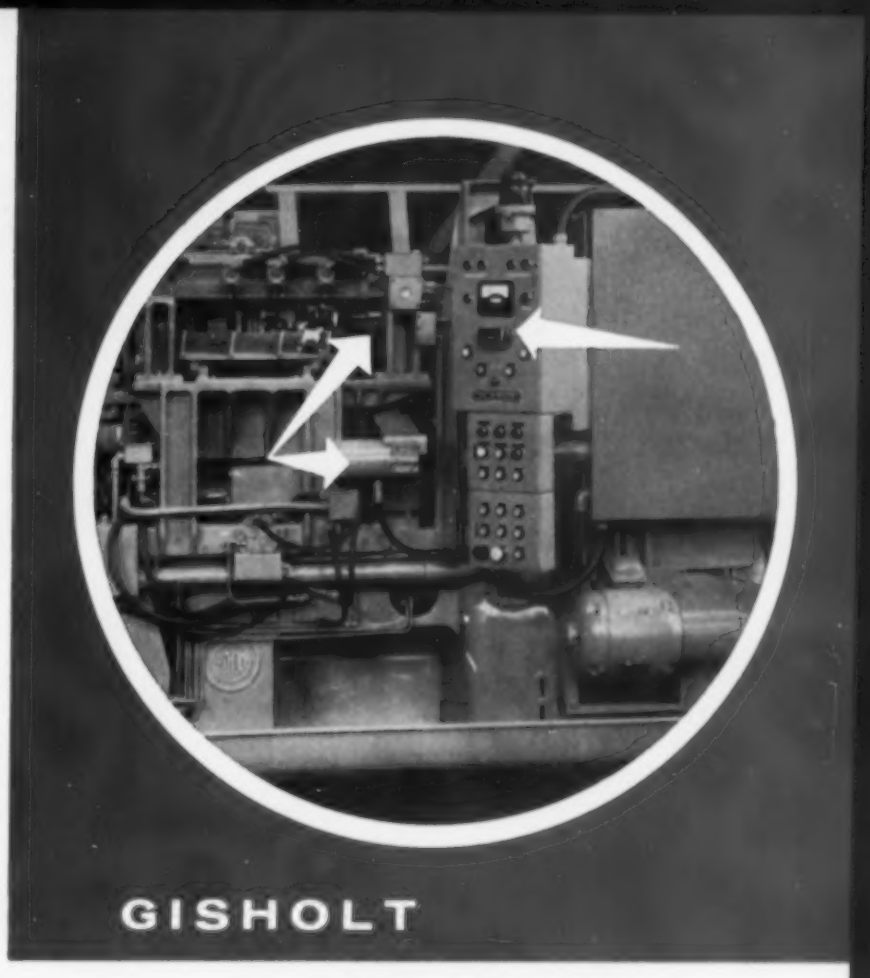
Alabama Pipe Co., Anniston, Ala., will close its branch plant at Talladega, Ala., about Aug. 15. This plant, like the one at Gadsden, Ala., and the main plant at Anniston (closed last year), "is a casualty of the trend toward automation in industry." The three plants had been manufacturing products by hand methods. The firm is constructing a multimillion dollar, completely mechanized plant at Anniston where all the company's operations will be consolidated.

Birdsboro Steel Diversifies

Birdsboro Steel Foundry & Machine Co., Birdsboro, Pa., took another step in diversifying when it merged with Universal Major Electrical Appliances Inc., Baltimore. The only manufacturing operations of Universal are conducted under the name of Miraval Corp., maker of porcelainized metal sheeting for interior and exterior walls.

Birdsboro also has announced the shipment of the first of three 2750-ton extrusion presses to Kaiser Aluminum & Chemical Corp.'s plant at Halethorpe, Md. This shipment represents the official entry of Birdsboro into the extrusion field. Birdsboro is also building a fourth press of the water hydraulic type for Kaiser. The four presses will

(*Please turn to page* 86)



always "ON TARGET"...
automatically with

P&W AUTOMATION GAGING

Quantity, quality or both . . . whatever your primary objective may be, Pratt & Whitney Automation Gaging — in-process checking plus "feed-back" control for automatic machine adjustment — can help you hit your production targets. Here are: *Greater Accuracy* than ever before possible, *Increased Output*, because there are no production shutdowns to gage parts and re-adjust the machine; and *New Economies* through fewer rejects.

Is Automation Gaging practical and proved? This Gisholt Automatic with P & W Gaging produces a finished precision rotor for fractional horsepower motors *every 10 seconds*. Machine operation with self-correction, size control, inspection of finished parts and sorting are all completely automatic.

Don't wait and wonder about automation. GET THE FACTS. Write to P & W *today* outlining your machining-gaging problems and let Pratt & Whitney Specialists show you how to hit your production target . . . automatically!

PRATT & WHITNEY COMPANY
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13 Charter Oak Boulevard, West Hartford 1, Connecticut
Direct Factory Representatives in Principal Cities

MACHINE TOOLS GAGES CUTTING TOOLS

TOMORROW:

A standard motor that can survive infinite heat

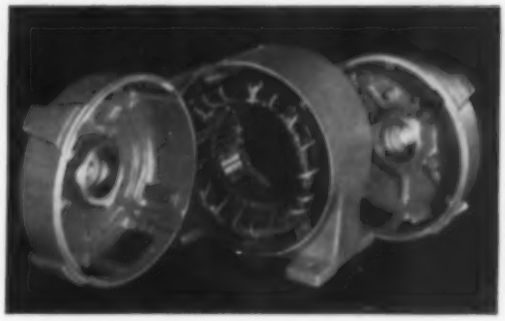
The new Life-Line A is another step closer

Westinghouse is working on tomorrow's motor today. Investigating new materials—testing existing motor designs.

No standard motor today can survive the ultimate test shown here. But we do know that the new Life-Line® "A" can operate under higher temperatures than ever before. It has stronger insulation and better bearing protection than any other motor on the market. It's industry's closest approach to a standard motor that is absolutely heatproof.

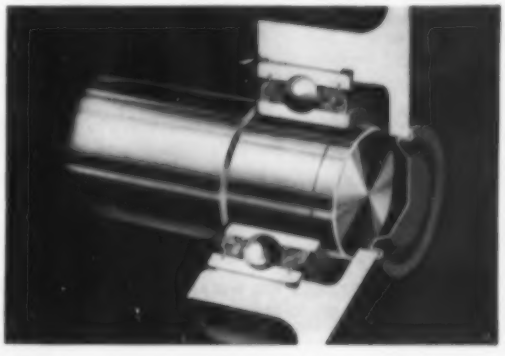
Your Westinghouse sales engineer can show you many additional reasons why the Life-Line "A" is industry's most advanced and preferred motor. Call him today.

J-21928



New fortified insulation includes exclusive Bondar, Bondite and Mylar*—three good reasons why the Life-Line "A" is so resistant to heat or any other motor contamination.

*DuPont Registered Trade-Mark



Two outer seals of new 4-way sealed bearing act as flingers and literally throw off damaging contaminations. Inner seals, attached to outer bearing race, are stationary and form a positive labyrinth.

WATCH WESTINGHOUSE!

WHERE BIG THINGS ARE HAPPENING TODAY!

(*Concluded from page 83*)
raise the Halethorpe plant capacity from 24 million to 46 million lb of aluminum shapes a year.

Follansbee Buys Product Line

Follansbee Steel Corp.'s Sheet Metal Specialty Division, acquired the complete line for the manufacture of steel lockers, cabinets and shop equipment from Steel Service Mfg. Co., Steubenville, O. The line will be expanded to include other allied products. A. R. Florio is general manager of the division.

Screw Product Firms Merge

Diamond Screw Products Co. and Detroit Nut Co. merged. The organization, directed by David S. Diamond, is known as Detroit-Diamond Screw Products Co., 2200 Fourth St., Wyandotte, Mich.

United Shoe Sells Divisions

United Shoe Machinery Corp., Beverly, Mass., sold two of its divisions to Plymouth Cordage Co., Plymouth, Mass. These divisions are: W. W. Cross & Co. (tacks and nails), East Jaffrey, N. H., and J. C. Rhodes & Co. (eyelets), New Bedford, Mass.

Opens Detroit Foundry

Wall Colmonoy Corp. consolidated its Detroit operations in its new foundry at 19345 John R. St. The foundry contains a complete line of molding equipment, electric melting furnaces and production machinery for manufacturing alloy welding rods, electrodes and powder. Also included in the new building are expanded facilities for the firm's Stainless Processing Division.

U. S. Steel Orders Furnace

United States Steel Corp., Pittsburgh, awarded a contract to Gas Machinery Co., Industrial Furnace Division, Cleveland, to install a heat treating furnace (car bottom type) at its Duquesne, Pa., Works.

Buys Horton Chuck Division

Greenfield Tap & Die Corp., Greenfield, Mass., purchased the Horton Chuck Division of E. Horton & Son Co., Windsor Locks, Conn. Manufacturing operations are continuing in Windsor Locks. D. H. Thomson is general manager of the Horton Chuck Division; G. S. Chiaramonte, sales manager.

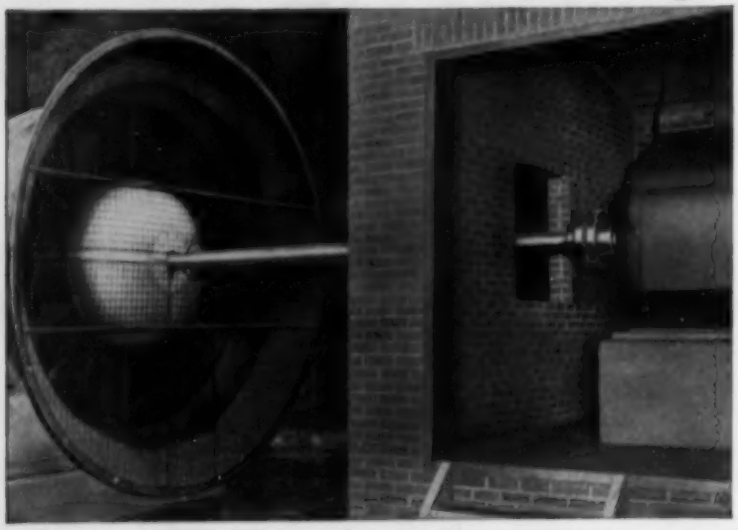
Bohn Aluminum To Build

Bohn Aluminum & Brass Corp., Detroit, plans to build a plant near Butler, Ind. It will contain about 150,000 sq ft of space. The plant will consist of a foundry and a high-speed aluminum rod rolling facility.

Republic Orders Slabbing Mill

Republic Steel Corp. placed an order with United Engineering & Foundry Co., Pittsburgh, for a 45 by 90-in. two-high universal slabbing mill for its Cleveland works. The order includes the necessary auxiliary equipment for ingot handling through to the shearing and piling of finished slabs. The mill will be powered by two 6000-hp electric motors and will have an edger driven by one 4000-hp motor. It will handle ingots up

Eliminate Intermediate Bearings!



By using Thomas Flexible Couplings on long, unsupported shafts, intermediate bearings are eliminated. Thomas engineers tubular shafts free from lateral whip.

The large fan shown above is 16' from the motor to allow sufficient air intake. Miners working underground receive their fresh air supply from this fan and others like it, which have been giving dependable service for as long as fifteen years . . . without shutdowns for lubrication or maintenance of the couplings.

Thomas floating shaft flexible couplings are recommended for machine and marine drives, printing presses, paper and cement mills, cooling towers, diesel engines, pumps, compressors, and many other uses.

Only Thomas Flexible Couplings offer *all* these advantages
UNDER LOAD and MISALIGNMENT

1. Freedom from Backlash—Torsional Rigidity
2. Free End Float
3. Smooth Continuous Drive with Constant Rotational Velocity
4. Visual Inspection in Operation
5. Original Balance for Life

. . . *and*

THOMAS ALL METAL COUPLINGS HAVE NO WEARING PARTS SO LUBRICATION AND MAINTENANCE ARE ELIMINATED

Write for Engineering Catalog 51A

THOMAS FLEXIBLE COUPLING COMPANY
WARREN, PENNSYLVANIA, U.S.A.

A 2,370 lb.

CORED FERROUS FORGING

Large angular voids make this heavy component difficult to produce by any other method than Cameron's split die forging process.

The tremendous saving of machining time plus better grain structure on this launching valve body produce a superior component for our nation's defense.

For large, intricate ferrous forgings with both internal and external contours in sizes from 2,000 to 5,000 pounds, write or call . .

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IRON WORKS, Inc.

SPECIAL PRODUCTS DEPARTMENT
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DEPENDABLE
QUALITY • PRICE • SERVICE
Electro-manganese
99.9+%
STANDARD OF THE WORLD FOR PURITY
MN

ALSO AVAILABLE
Nitrelmang
A Stable Nitrided ELECTROMANGANESE
Both made by the pioneer producer of electrolytic manganese.
FOOTE MINERAL COMPANY
Electro-manganese DIVISION
BOX 479 • KNOXVILLE, TENNESSEE
WRITE FOR BOOKLET

to 47,000 lb. The mill is expected to be completed early in 1957.

Kennametal Inc. Expanding

Kennametal Inc., Latrobe, Pa., is expanding its manufacturing facilities there. The first unit will provide 25,000 sq ft of floor space and will be utilized for grinding and finishing of special or custom-fabricated carbide products.

Texas To Get Steel Pipe Plant

Michigan Seamless Tube Co., South Lyon, Mich., organized a subsidiary, Gulf States Tube Corp., to operate a plant at Rosenberg, Tex. Seamless steel tubing and pipe will be produced in sizes ranging from ⅛-in. to 3 in. outside diameter in carbon and alloy grades.

Buys Utica Drop Forge & Tool

Kelsey-Hayes Wheel Co., Detroit, will purchase all outstanding stock of Utica Drop Forge & Tool Corp., Utica, N. Y. Utica Drop Forge will be operated by Kelsey-Hayes as a wholly owned subsidiary, producing compressor and turbine blades for jet aircraft; making tools; and doing vacuum melting of metals.

Mesta Acquires Foundry

Title to the foundry and machine shop at New Castle, Pa., has passed from the government to Mesta Machine Co., Pittsburgh. The plant was built in 1942 to meet urgent defense requirements for heavy steel castings at a cost of $23 million, including purchase of machinery and equipment. It had been operated by United Engineering & Foundry Co., Pittsburgh, on defense contracts under a lease which expired Mar. 31, 1955. Facilities include four open-hearth furnaces.

Broadens Research Facilities

National Carbon Co.'s research laboratories in Parma, O., will be dedicated Sept. 18. Designed for basic research in chemical and solid state physics, the multimillion dollar facility brings to seven the number of major research centers operated by divisions of the firm's parent company, Union Carbide & Carbon Corp., New York. The corporation spent about $43 million on research last year.

Sharon Orders Blooming Mill

United Engineering & Foundry Co., Pittsburgh, is building a blooming and slabbing mill for Sharon Steel Corp., Sharon, Pa. It is a 44 in. by 104 in., two-high mill, powered by two 4000-hp motors. It will roll ingots weighing up to 12,000 lb.

NEW ADDRESSES

Catalina Steel Co., distributor of sheet products, moved to 3165 E. Slauson Ave., Los Angeles 58, Calif.

Dow Chemical Co. moved its New Orleans sales office to 305 Maritime Bldg. Robert J. Minbiole is manager.

ASSOCIATIONS

Raymond J. Brown was appointed West Coast representative of **Copper & Brass Research Association,** New York. He has offices in Los Angeles.

Truck - Trailer Manufacturers Association, Washington, appointed Charles J. Calvin assistant managing director.

R. A. Colton, Federated Metals Division, American Smelting & Refining Co., was elected chairman of the New York-New Jersey metropolitan chapter of the **American Foundrymen's Society,** Cleveland.

Charles W. Briggs, technical and research director, **Steel Founders' Society of America,** Cleveland, will address the twenty-third International Foundry Congress being held in Dusseldorf, Germany, Sept. 6. Title of his paper is "Green Sand Molding of Large Steel Castings."

Designed and built by

UNITED

4-HIGH 2-STAND TANDEM BRASS MILL

UNITED

ENGINEERING AND FOUNDRY COMPANY

PITTSBURGH, PENNSYLVANIA

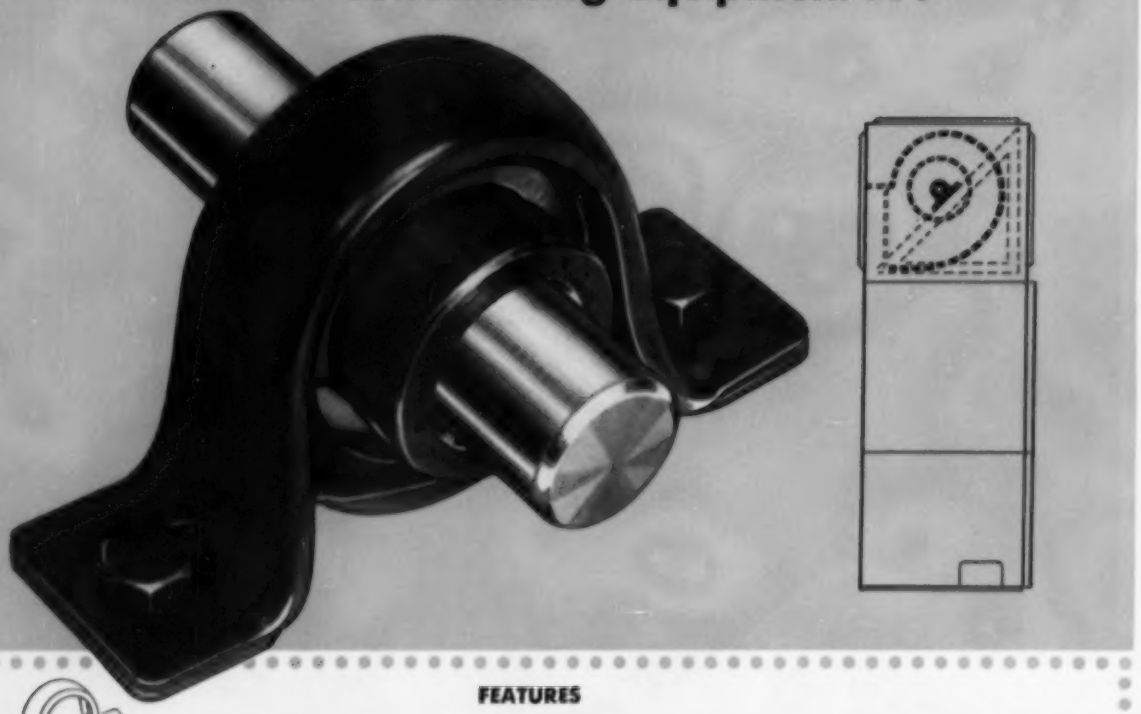
Plants at: PITTSBURGH • VANDERGRIFT • YOUNGSTOWN • CANTON
WILMINGTON (LOBDELL UNITED DIVISION)

Subsidiaries: ADAMSON UNITED COMPANY, AKRON, OHIO
STEDMAN FOUNDRY AND MACHINE CO., INC., AURORA, INDIANA

Designers and Builders of Ferrous and Nonferrous Rolling Mills, Mill Rolls, Auxiliary Mill and Processing Equipment, Presses and other Heavy Machinery. Manufacturers of Iron, Nodular Iron and Steel Castings, and Weldments.

Here's an Economical and Efficient Improvement

for Air Conditioning Equipment . . .



FEATURES

Two-piece, pressed steel housing . . . occupies less space than similar pillow block housings.

Precision ball bearing, Fafnir Extended Inner Ring Type, offers extra wide bearing surface on shaft. Balls and races are finished for super-quiet performance.

Self-locking bearing collar of counterbored, mated-cam construction. Needs no lock washers, adapters, or other positioning devices.

Plya-Seals provide positive retention of lubricant and complete protection against contaminants. Special lubricant pre-packed at factory contributes to quietness of operation.

Thick, electric current-conducting rubber interliner eliminates the need for metallic grounding springs or clips.

Six-page bulletin on all Fafnir Air Conditioning Units provides detailed information including dimensions and load ratings.

Specifically designed for air conditioning units with fan shafts up to an inch in diameter, the Fafnir RPB Type Ball Bearing Pillow Block offers an inexpensive way to improve performance, increase sales appeal. It has been adopted as standard equipment by several manufacturers. Actual installations are demonstrating its advantages.

Next to super-quiet, trouble-free performance, manufacturers are most impressed with the easy installation of RPB units. The bearing slip-fits onto shaft and is positively locked to it by a quarter turn of the famous Fafnir self-locking collar. The housing is installed with two bolts. It affords unrestricted initial alignment in all directions. For more information on the RPB unit and other Fafnir super-quiet ball bearing units designed specifically for air conditioning and heating equipment, write The Fafnir Bearing Company, New Britain, Connecticut.

FAFNIR

BALL BEARINGS

MOST COMPLETE LINE IN AMERICA

Technical Outlook

CASE FOR STAINLESS— A liquid salt bath is a simple, effective way to nitride stainless steels, says Boeing Airplane Co., Seattle. Engineers tested Types 321, 440C, A-286, 17-7 PH and Nitralloy 135. Results: Case hardnesses up to VHN 1355, case thicknesses up to 0.0035-in., oxidation resistance up to 600°F. Nickel plate 0.001-in. thick makes a good mask.

SOLDERLESS SEAL— Corning Glass Works, Corning, N. Y., is hermetically sealing glass to metal without solder or gaskets. Initial use of the method is in sight glass windows sealed to nearly all ferrous and nonferrous metals. The seal is tamperproof, unaffected by aging or vibration, and resistant to high pressures, says Corning.

ICE IS NICE— You can machine thin metal honeycomb sections easily if you freeze them. That's the method Northrop Aircraft Inc., Hawthorne, Calif., uses to machine guided missile assemblies. A refrigeration unit is coupled to a standard milling machine. Water poured into the cells of the material freezes in a few minutes. A small meat slicer blade shears the frozen material quickly; bevel cuts, slots, concave and convex shapes can be made.

DEOXIDIZING GREASES— Amines are the best inhibitors of oxidation in greases, says an Army Ordnance Corps report. Of 45 compounds tested, the phenylenediamines were on top.

STRESSED NICKEL— An addition agent, developed by Sel-Rex Precious Metals Inc., Belleville, N. J., added to an ordinary Watts nickel plating bath gives compressively stressed nickel deposits. It's recommended as an undercoat for rhodium plating to reduce tendency for cracking and peeling and to give thin rhodium plate more wear resistance. Compressively stressed deposits are also of interest to engineers concerned with increasing the fatigue life of nickel plated parts.

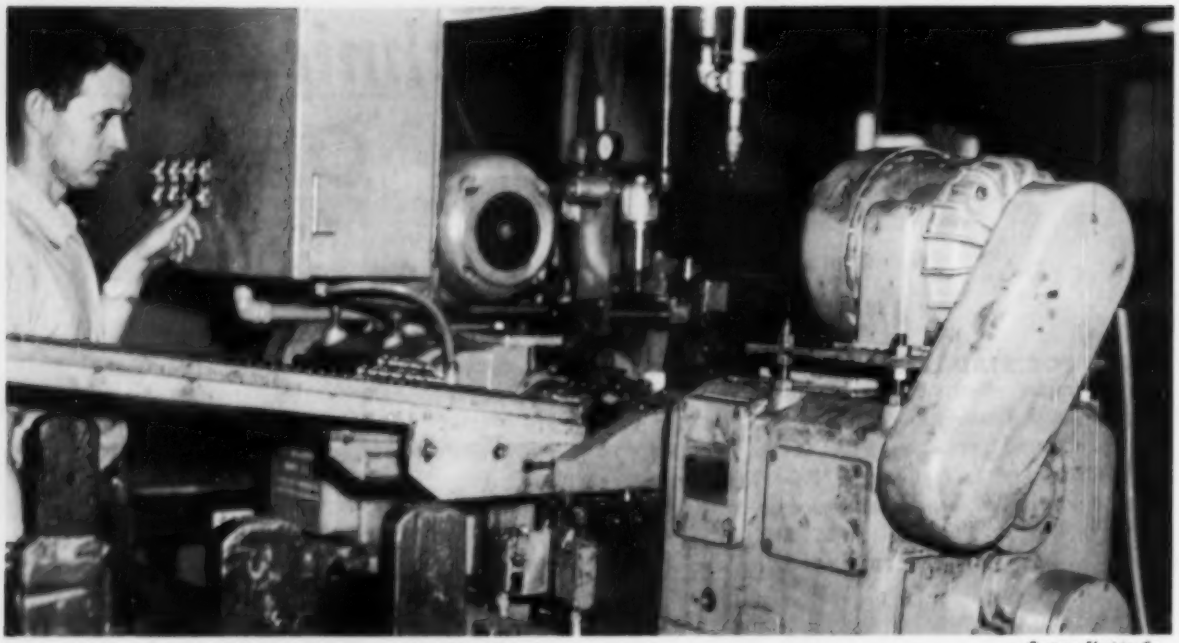
SOLAR SILICON— If you want to make solar batteries, the price of silicon is down—to $180 a pound. If you insist on the somewhat purer semiconductor grade, Du Pont will be glad to sell you that, too, at $350 a pound. Solar cells, however, work nicely at the bargain rate.

MAGNETIC BONDING— A new process for joining dissimilar metals causes molecules to act upon each other and form a superstrong bond. To take the metals apart, neutralize the bonding action by reversing the magnetic field that caused it, says Del S. Harder, executive vice president, Ford Motor Co.

VIVA PORCELAIN— Paul V. Mara of the Porcelain Enamel Institute estimates that the next five years will show an increase of 500 per cent in the amount of porcelain enamel on aluminum. This year 3,600,000 pounds of porcelain enamel on aluminum were produced, 80 per cent for architectural applications, but Mr. Mara also sees a big boom in its use in transportation, appliances, sanitary ware and industrial applications.

SHARE THE LOAD— When suspended basic open hearth refractory brick showed a tendency to slip out of their metal cases, the Geo. P. Reintjes Co., Kansas City, Mo., came up with a method for using the metal case to help support the brick. Brick are designed with end notches into which ceramic hangers hook. The hanger grips both the metal case and the brick itself, locking the two firmly together.

Metalworking Outlook—p. 43 *Market Outlook—p. 135*



Century Electric Co.

More New Motors To Come

New NEMA standards for 30 to 125 hp ac motors will start appearing on production models in 1957. New standards for the 1 to 30 hp range are already well established

THE NEW LOOK in electric motors is being extended to include all but a fraction of those used by industry.

Some two years ago, the electrical industry, through its National Electrical Manufacturers Association (NEMA), revised design specification for integral-horsepower alternating current motors in the 1 to 30 hp range.

Now a similar program will lead manufacturers into revamping their motors to include those up to 125 hp. Already approved, the NEMA recommendations for the bigger motors will be worked into production as rapidly as makers can redesign.

Across the Board—As in the case of the earlier NEMA rerates, these will be entirely voluntary. NEMA advises motor makers: "Any motor manufacturer is free to use or not to use this Suggested Standard for Future Design."

The effect on motor users, however, is almost the same as if the standard were compulsory. Since new standards represent the opinions and wants of most member companies, it's a foregone conclusion that many major builders will waste no time gearing production around the new models.

This, in turn, will bring other makers onto the band wagon as they hustle to offer competitive lines to customers who use multiple motor sources, and who logically prefer one set of standards for all motors they buy.

Conversion Is Slow — Although the new standards are now officially approved, new models probably will not be available until early 1957. When makers redesign to new models they'll also incorporate other improvements.

In addition, they'll design the new models for automatic production when they can, taking advantage of the design switch to update production methods.

Though the new NEMA frame assignments go through 100 hp for the totally enclosed, fan cooled, and through 125 hp for open motors, many makers will redesign through 200 hp to update more models in the same program.

Easier—Motor users will have less trouble with the new NEMA switches than they did with the 1 to 30-hp program. No new frame dimensions or mounting standards are required.

Earlier revisions on the smaller motors changed mounting dimensions so that some users were forced to change patterns or tooling to accomodate the new models. This forced some buyers to postpone conversion until the last minute. In many cases it took a price differential favoring new models (5 per cent is the usual amount) to justify the change.

How's It Going?—To find out how the change in smaller motors is working out, STEEL surveyed a dozen major motor builders. They figure that with roughly two years of production under their belts, the changeover is about 70 per cent complete. It's even heavier than that in the 1 to 5 hp range, where the 5 per cent premium on old models is nearly universal.

Biggest deterrent to the changeover has been the altered dimensions, particularly as they affect mounting, shaft height and shaft

New motors are standard in the new 00 Automatic Screw Machines built by Brown & Sharpe Mfg. Co., Providence, R.I. Machine tool builders are among the leaders to switch to the new frame sizes

size. Principle advantages of the new motors over the old are the reduced size and weight per horsepower. Since new motors might have required design changes in mounting flanges or brackets, some users asked: "Why pay for altering our product when the old motors still fill the bill.

The answer has come partly through the price differential where it exists, and through new product design programs. Whenever equipment is redesigned, it is designed to take the new motors. Despite some conflict between the Joint Industry Conference (JIC) standards and the new motors, JIC applications also have started to swing to the new motors. At Ford Motor Co., (the auto industry is the big JIC group) the edict has come down: When new equipment is bought, the new NEMA frame assignments are musts.

Brown & Sharpe Mfg. Co., Providence, R. I., has gone to the new frame sizes for their all-new 00 automatic screw machine. B&S engineers told STEEL: "The decrease in weight of the new motors is advantageous on applications involving the mounting of motors on slides. This is particularly true where the motor weight constitutes an overhanging load." They feel that the "new practice of using continuously marked leads" simplifies inspection and reduces chances for error.

Another big builder of machine tools (lathes, in this case) got an even more direct benefit from the new frames. He was able to substitute a higher-horsepower motor in some of his lathes with no change (except mounting provisions) in the machine tools. Other builders have held back on this power increase, pointing out that gear trains and other parts of the drive are not engineered for higher horsepower.

Survey Results—In the STEEL survey of motor builders only one said he had actually discontinued manufacture of the old frame sizes. He no longer offers frames 203 and 254, 1½ and 5 hp.

Eight manufacturers report they no longer make sleeve-bearing designs in open motors in the 1 to 30 hp-range.

DC Motors—NEMA also has new standards for direct current motors. They'll be called "industrial direct current motors" rather than "general-purpose direct current motors."

Here are the principle changes in the direct current motor program, as given by M. E. Knudson of Westinghouse's motor and control division:

1. No standard frames.
2. Combined constant speed and adjustable speed ratings, reducing the former 502 ratings to 156.
3. Better dynamic qualities.
4. Nominal voltage 120 and 240 instead of 115 and 230.
5. Class B insulation standard.
6. Dripproof motors may be rated 60°C rise with service factor.

This article was prepared with the assistance of: Allis-Chalmers Mfg. Co., Century Electric Co., General Electric Co., Howell Electric Motors Co., Lima Electric Motor Co., Reliance Electric & Engineering Co., Robbins & Myers Inc., A. O. Smith Corp., Sterling Electric Motors Inc., U. S. Electrical Motors Inc., Wagner Electric Corp., Westinghouse Electric Corp.

New NEMA Frame Sizes for AC Motors

Open Motors—60 Cycles

hp	3600 rpm	1800 rpm	1200 rpm	900 rpm
20	...	...	...	364
25	...	...	364	365
30	...	...	365	404
40	...	364	404	405
50	364	365	405	444
60	365	404	444	445
75	404	405	445	...
100	444	444	...	...
125	445	445	...	...

Totally Enclosed, Fan Cooled Motors—60 Cycles

hp	3600 rpm	1800 rpm	1200 rpm	900 rpm
20	...	...	...	364
25	...	...	364	365
30	...	...	365	404
40	364	364	404	405
50	365	365	405	444
60	405	405	444	495
75	444	444	445	...
100	445	445	...	...
125	...	...	...	...

Hurry-Up

Quick Bath Correction Chart for Use with Automatic Titrator

BATH	7 oz Per Gallon Alkali Cleaning Bath*	7 Per Cent Sulphuric Acid Pickle Bath	8 Per Cent Muriatic Acid Pickle Bath	0.30 Per Cent Na_2O Neutralizing Bath	
TEST METHOD	Pipette 10 ml bath sample into 100 ml of water. Titrate with 2.04 normal H_2SO_4	Pipette 10 ml bath sample into 200 ml of water. Titrate with 2.04 normal NaOH	Pipette 10 ml bath sample into 200 ml of water. Titrate with 2.74 normal NaOH	Pipette 100 ml bath sample into 100 ml of water. Titrate with 1.0 normal H_2SO_4	
	TO BRING BATH UP TO STRENGTH ADD:				
	Lb of cleaner* per gal of water	Lb 66° baume H_2SO_4 per gal of bath	Lb 20° baume muriatic acid per gal of bath	Lb per gal of bath	
Titrator Reading				Soda ash	Borax
3.0		0.024			
3.2		0.023			
3.4		0.022			
3.6		0.020			
3.8		0.019			
4.0		0.017	0.250		
4.2		0.016	0.242		
4.4		0.015	0.234		
4.6		0.014	0.225		
4.8		0.013	0.217		
5.0		0.012	0.208		
5.2		0.010	0.200		
5.4		0.009	0.192		
5.6		0.008	0.183		
5.8		0.007	0.175		
6.0	0.2256	0.006	0.167	0.0165	0.0055
6.2	0.2162	0.005	0.158	0.0160	0.0050
6.4	0.2068	0.003	0.150	0.0150	0.0050
6.6	0.1974	0.002	0.142	0.0140	0.0045
6.8	0.1880	0.001	0.133	0.0135	0.0040
7.0	0.1786		0.120	0.0125	0.0040
7.2	0.1692		0.117	0.0115	0.0040
7.4	0.1598		0.108	0.0105	0.0035
7.6	0.1504		0.100	0.0095	0.0030
7.8	0.1410		0.092	0.0085	0.0030
8.0	0.1316		0.083	0.0075	0.0025
8.2	0.1222		0.075	0.0065	0.0020
8.4	0.1128		0.067	0.0060	0.0020
8.6	0.1034		0.058	0.0050	0.0020
8.8	0.0940		0.050	0.0040	0.0015
9.0	0.0846		0.041	0.0030	0.0010
9.2	0.0752		0.034	0.0020	0.0005
9.4	0.0658		0.026	0.0010	0.0005
9.6	0.0564		0.017	0.0010	
9.8	0.0470		0.009		
10.0	0.0376				
10.2	0.0282				
10.4	0.0188				
10.6	0.0094				
	(Titrator reading equals ounces per gal of cleaner)	(Titrator reading equals per cent H_2SO_4 in bath)	(Titrator reading equals per cent muriatic acid in bath)	(Titrator reading times 0.031 equals per cent NA_2O in bath)	

*Any alkaline cleaner in common use

Solution Control

Porcelain enamelers will find these charts handy for quick correction of pickle room baths and nickel dip

Nickel Determination with the Electrophotometer

Per cent transmission	Nickel deposition (Wave length 535 mU)	Nickel concentration in bath (Wave length 640 mU)	
	Grams of nickel per square foot of metal surface	Ounces of single nickel salts per gal	Add pounds of single nickel salts per gal of bath for 2 oz per gal concentration
25	0.090		
30	0.078		
35	0.068		
40	0.060		
45	0.052		
50	0.045		
55	0.038		
60	0.032	4.0	
65	0.028	3.4	
70	0.023	2.8	
75	0.018	2.3	
80	0.014	1.7	0.031
85	0.010	1.2	0.062
90	0.006	0.8	0.093
95	0.003	0.3	

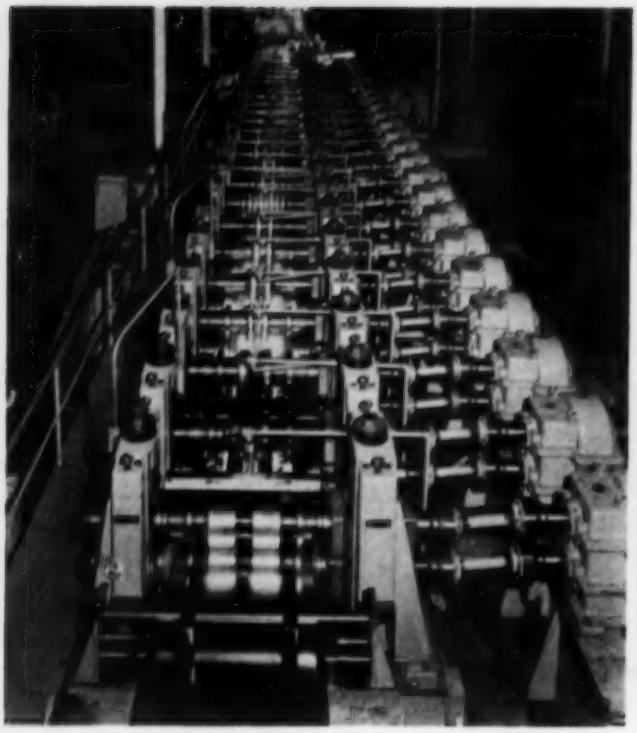
• *An extra copy of this article is available until supply is exhausted. Write Editorial Service, STEEL, Penton Bldg., Cleveland 13, O.*

PORCELAIN ENAMELING with a low reject rate takes tight control. Control of pickling and cleaning is important. Control of nickel deposition and bath concentration is a must.

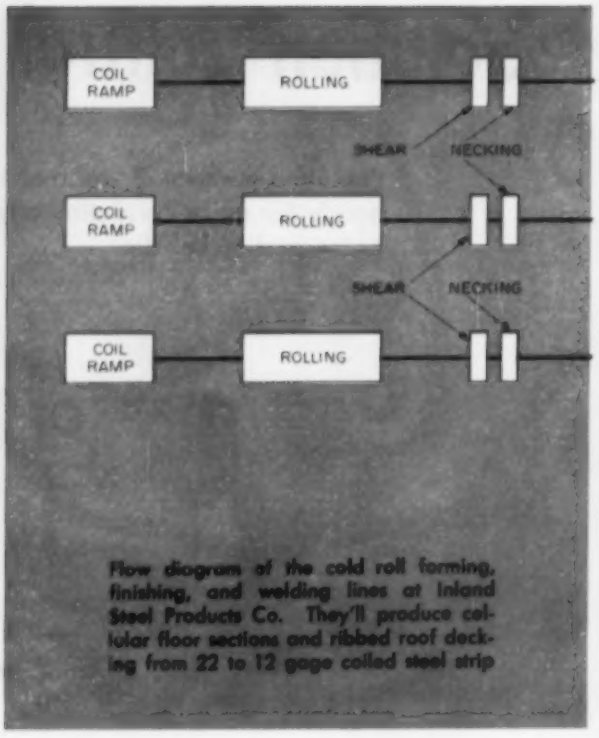
The old standard methods for determining bath concentrations and nickel deposition are too time consuming for modern high-production enameling plants. They are being rapidly replaced by fast-reading instrumental methods, in particular the automatic titrator and electrophotometer.

Charted—These two instruments remove most of the drudgery and guesswork of laboratory determinations, but the answers they give must still be interpreted. There's room for human error in converting instrument readings into pounds of chemical to be added to bring a bath back to proper concentration.

M. Bozsin and F. G. Allenbaugh of Technical Center, Ferro Corp., Cleveland, have devised a set of conversion charts (left). They translate electrophotometer and automatic titrator readings directly into bath addition quantities for standard enameling pickle-room solutions. To use the charts, simply multiply the chart figures by the number of gallons in the bath.



One of three cold roll forming mills at Inland Steel Products Co., Milwaukee. Flying shear is at the far end



Flow diagram of the cold roll forming, finishing, and welding lines at Inland Steel Products Co. They'll produce cellular floor sections and ribbed roof decking from 22 to 12 gage coiled steel strip

Rolling Mill for Roofs and Floors

METAL FLOORS which boast utility and service features unmatched by conventional concrete construction, which offer reduction in multistory weight up to 18 per cent, which have a cost comparable to or less than conventional concrete. . .

How would you rate the market possibilities of such a product?

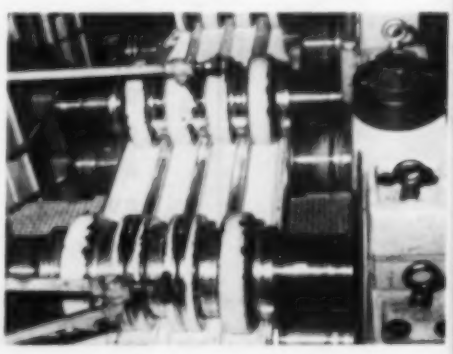
Wager — Inland Steel Products Co., Milwaukee, has bet $2.5 million in recent expansion that the market for cellular steel floors and metal roof decking is just beginning to open up. Says William A. Jahn, president: "We think this new installation will double our entire company volume by 1960."

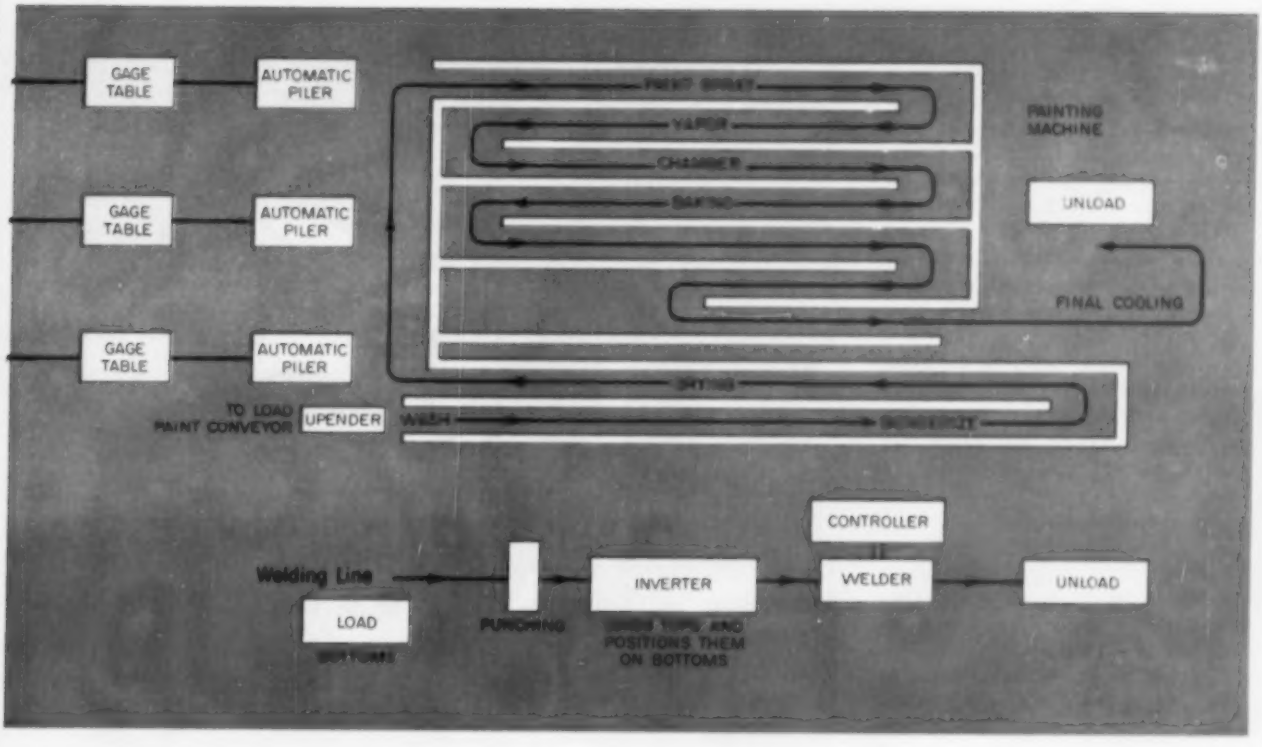
There are three segments to the new facility, explains Norman D. Rice, vice president-engineering, who helped design much of the equipment: 1. Three cold roll forming mills, probably the world's longest. 2. An automatic 130-ft welding line. 3. One of the nation's largest automatic bonderizing and enameling installations.

Features—The three mills were built by American Roller Die Corp., Wickliffe, O. "A" and "B" mills are 120 ft long, "C" mill is 100 ft. All are coil fed. Coils go up to 20,000 lb.

Each has an operator's bridge from which full control of the coil feed and mill operation is possible. Controls between roll stands permit full control from anywhere on the line. Built into each mill are Verson presses adapted for sliding, die type flying shears and necking or crimping panel ends.

Rzeppa universal joints on the roll drives were selected because they could provide constant speed and velocity to the rolls. Power is provided by 150 to 200 hp motors through Ardcor gear trains. All rolls are high carbon, high





At Inland Steel Products Co., Milwaukee, three cold roll forming mills and a huge finishing machine feed a soaring market in cellular metal roof and floor sections

chrome steel which is hardened, ground and polished.

Step-by-Step — Here's the sequence of operations of each mill: 1. Hydraulic mechanism moves coil of galvanized steel from the coil ramp to the payoff reel. 2. Coil is fed through a mechanical leveler and coil flattener onto a gage table to align strip with the mill. 3. Sheet goes through forming rolls of the mill, including five roll straighteners, into flying shears and necking operations. 4. An automatic gage table operates the shear and necking cycles and provides final forming. 5. Pieces go to a hydraulic lift table where they are automatically pallet loaded in packs which weigh about 10,000 lb.

Overhead cranes take pallets to storage, welding line or painting line. At the automatic welding line, pallets are placed on a hydraulic lift table where a magnetic device transfers panels to a conveyor for automatic punching of the bottom half of flooring. At the next station, hydraulic lifting and magnetic devices team up to flip over the top panels and position them on companion bottom pieces to be

These Specs Give the Mills Their Muscle

	Over-all Length	Number of Stands	Spindle Diameter	Roll Diameter	Spacing Between Rolls	Rolling Speeds
A Mill	120 ft	22	4½-in.	12 in.	30 in.	Up to 185 fpm in 18 through 22 gage
B Mill	120 ft	24	6 in.	15 in.	36 in.	Up to 110 fpm in 12 through 18 gage
C Mill	100 ft	20	6 in.	19 in.	36 in.	Up to 110 fpm in 12 through 18 gage

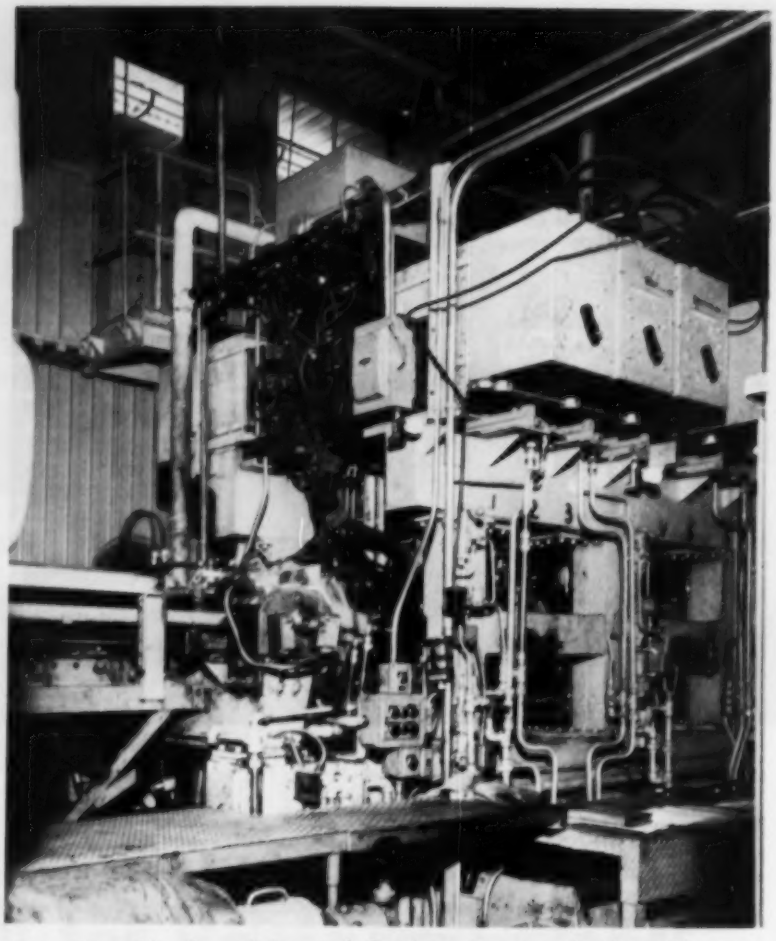
fed into the king-size welder.

Special Welder — The welding machine was developed by Inland Steel Products engineers and Banner Welders Inc., Milwaukee. Fed by twenty-four 150 kva transformers, the machine spots 24 welds simultaneously. Welding speed ranges up to 40 fpm, with spacing of welds 4½-in. apart.

The welding process follows these cycles: On the upslope time factor, the zinc on the pieces is melted and squeezed from the faces to be joined by 2000 lb of electrode pressure. Welding heat is followed by a chill cycle (electrodes are water cooled), then annealing of the weld.

On the downslope cycle, as temperature is reduced zinc flows back over the weld as the electrode is removed. An automatic crane takes the finished pieces from the welding line to pallets.

Protection — Painting starts at the end of "A" mill which rolls roof decking sections. Panels, after being automatically palleted, go to an upender which tilts them to an 85-degree angle. Then they are manually hooked in a vertical position on an overhead conveyor.



Automatic welder for cellular steel flooring. It can make 24 welds simultaneously, with floor sections passing through at 40 fpm

Roof deck panels, 28 ft long, enter the paint processing machine. They will be automatically cleaned, bonderized, painted, baked and cooled

Nine panels (2 ft wide and up to 28 ft 6 in. long) can be loaded each minute on the conveyor. The cycle takes 1 hour 35 minutes—from the time the panel enters the first booth until it is unhooked from the conveyor as a finished piece.

All spraying and rinsing action in the booths is done by four wheels for each process with two to four nozzles per wheel. The rotating wheels are positioned vertically on both sides of the panels.

Paint Sequence—There are ten steps in the painting process:

1. Panels are cleaned (dirt, grease and lubricating oils) by a chemical spray. 2. Hot water rinse. 3. Bonderizing process—panels are coated with 70 to 100 milligrams of iron phosphate per square foot. 4. Bonderite chemicals are removed in a cold water rinse. 5. Chromic acid bath—inhibits action of hydroscopic salts. 6. Panel is dried in 300°F oven for 5 minutes and cooled at room temperature. 7. Nozzles spray a heavy continuous coating of epoxy-resin enamel on the panels. 8. Wet painted panels enter a vapor drain chamber.

Vapor for the chamber is provided from the painting operation. Through a special vapor control setup, as the panels progress, the vapor lowers progressively from top to bottom on the panel. This controls the paint drain-off and assures a uniform paint thickness over the entire length of the panel.

9 and 10. Enamel is polymerized, then hardened in a 400°F oven for 20 minutes, and finally cooled at room temperature.

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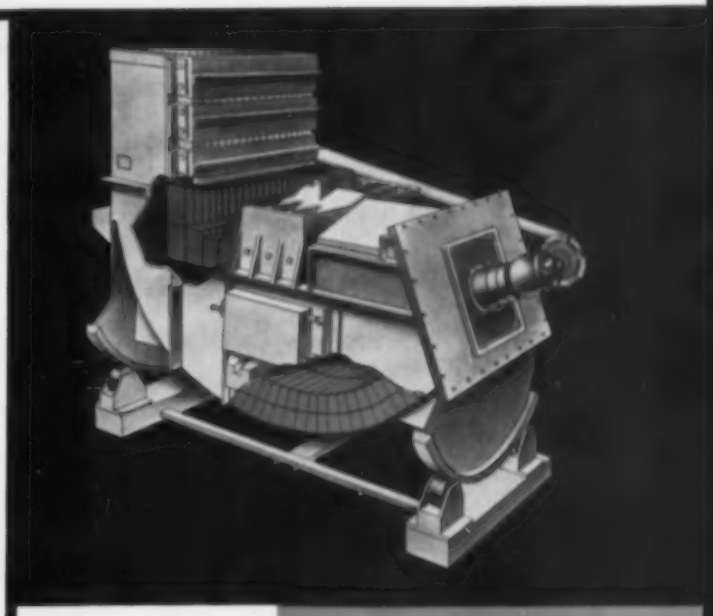
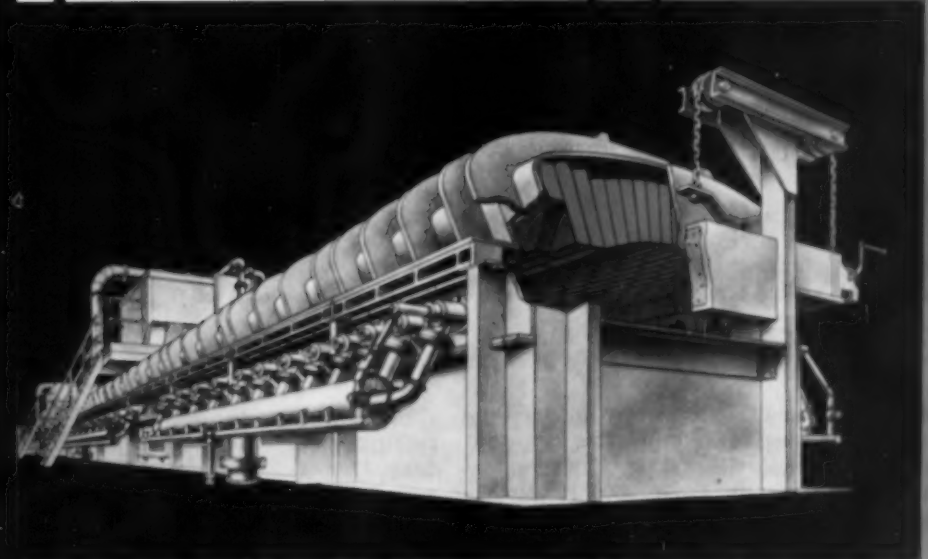
Why B&W Allmul Firebrick withstand punishing service in furnaces like these



▲ Direct-fired reverberatory furnace for melting brass, aluminum, and iron. For longer refractory life, B&W Allmul Firebrick are used to line the bath and arch.



◀ In this type of furnace for continuous high speed heating of strip for welding into pipe, temperatures in excess of 3000 F are common and the atmosphere is contaminated with iron oxide. Because of their resistance to spalling and metal penetration, B&W Allmul Firebrick have set new standards for refractory life in bungs, burner blocks and recuperators.

B&W Allmul Firebrick stand up under extremely high temperatures at continued high rates of operation because they are produced from electrically melted mullite grain by a highly efficient process. These top-quality brick have high hot-load strength, high resistance to spalling, good volume stability and a melting point of 3335 F.

They are practical from a cost standpoint for a wide range of applications in the ferrous and non-ferrous metal industries. Illustrated on this page are a butt-weld furnace as well as a direct-fired reverberatory furnace. Other services are direct and indirect-arc electric furnaces, air furnaces, furnace hearths subject to iron oxide scale attack, crucible melting units and furnaces melting many non-ferrous metals and alloys.

Your B&W representative can show you how B&W Allmul can lower your refractory costs in many heavy-duty services. Consult him or write for Bulletin R-34A, giving data on B&W Firebrick for exacting services.

B&W REFRACTORIES PRODUCTS: B&W Allmul Firebrick • B&W 80 Firebrick • B&W Junior Firebrick • B&W Insulating Firebrick • B&W Refractory Castables, Plastics and Mortars • B&W Silicon Carbide

BABCOCK & WILCOX

THE BABCOCK & WILCOX CO. REFRACTORIES DIVISION

GENERAL OFFICES: 161 EAST 42nd ST., NEW YORK 17, N.Y.

WORKS: AUGUSTA, GA.

Cold Clay—Since the top is colder than the metal, freezing starts instantly along the walls of the clay top. This forces the metal to feed through a hole which grows smaller as the ingot solidifies. Segregation will occur at the top of the ingot

Heated Clay—These tops are heated to 1800-2000°F before pouring. The top still is colder than the freezing temperature of the steel. The freezing pattern is the same as with a cold clay top, although not as pronounced

Gas Fired—All the heat from the gas flame is added to the top of the head metal. The metal again quickly solidifies along the head metal container walls in a V-shaped pattern

Electric Arc—In this process, all the metal is contained within the walls of the cast iron mold. Freezing starts immediately at the mold wall and results in a slightly V-shaped pattern

Feedex Lined—The temperature of the lining is about 3600°F. Metal can't solidify along the walls of the top until they have cooled to below the freezing temperature of the metal. The metal in the top freezes from the cooling effect of the ingot body. The freezing pattern in the top is the reverse of normal

Hot Tops Increase Ingot Yield

HOT TOP metal loss of only 4 per cent ingot weight.

Less segregation in the ingot.

Less splintering, fewer bursts in forging from ingot to billet.

Improvement of 3 to 10 per cent in yield; more billets per heat with the same furnace charge.

The Key—Those are achievements of Braeburn Alloy Steel Corp., Braeburn, Pa. The new element in Braeburn's steelmaking picture is an exothermic hot top composition called "Foseco Feedex."

Feedex is basically aluminum chips or powder and a combination of chemical compounds which are capable of releasing free oxygen to ignite the aluminum and give off heat. Most uses of the material are in lined clay hot tops.

Freezing Pattern—The temperature of the Feedex lining when pouring is about 3600°F. Metal can't solidify along the walls of the top as it does on tops whose temperatures are below the freezing point of the metal. Metal in a Feedex lined top freezes from the cooling of the ingot body.

Result: The freezing pattern within the hot top is the reverse of normal; normal segregation can't occur.

Distributor — The exothermic material was developed in England. It is distributed in the U. S. by Foundry Services Inc., Columbus, O. Eureka Refractories Co., Mt. Braddock, Pa., produces Feedex lined hot top brick.

Braeburn buys the material already rammed into clay hot tops from Eureka. Seven ingot sizes vary from 7 to 21 in. in diameter. The hot top material is smokeless and will not ignite until hot metal is near it. The compound ignites with a mild reaction at temperatures above 800°F, forming aluminum oxide.

Tool Steels — Braeburn uses Feedex in the production of all high speed and high alloy tool steels to supplement its 13 electric arc hot topping units. In some cases, entire heats are poured with Feedex topping.

Applications are increasing rapidly among alloy steelmakers. It's beginning to catch the eye of carbon steel producers.

Industrial Gas Mains 6" to 120"

...are best controlled by

Bailey GOGGLE VALVES

PROVED SAFE AND EFFICIENT ON GAS WASHERS, BLAST FURNACE MAINS, PRECIPITATORS, BOILER PLANTS

Mechanical Type

By means of a powerful clamping force applied equally at all points around the disc periphery, the Bailey Mechanical Goggle Valve provides a safe, tight seal for gas mains from 6" to 72" in diameter. The goggle plate is freed instantly by the same powerful mechanism, regardless of the length of time between operations. Both this type and Bailey Thermal Expansion Valves require only a minimum of maintenance.

Thermal Expansion Type

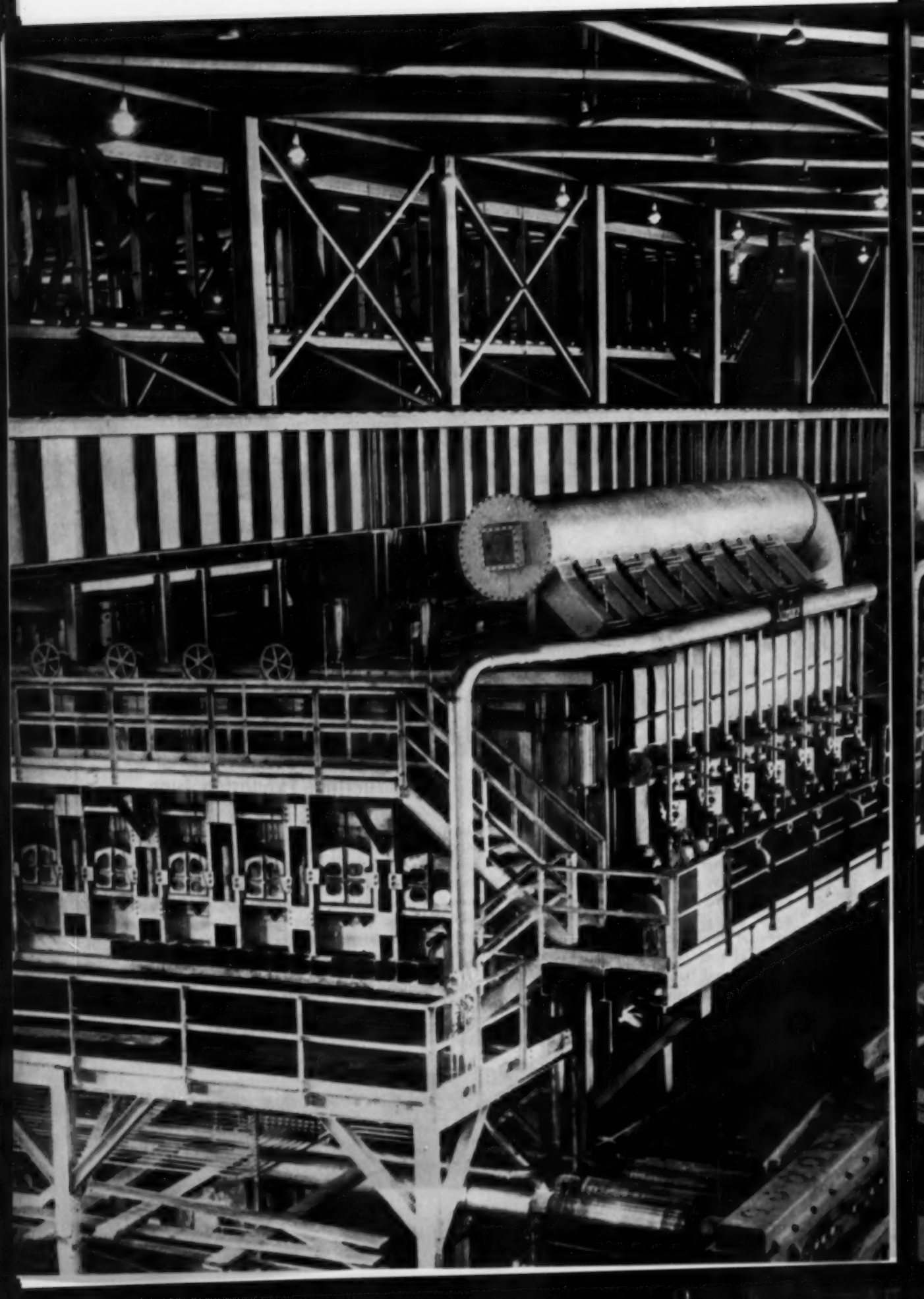
Designed for gas mains from 36" to 120", the Bailey Thermal Expansion type goggle valve operates by the linear expansion and contraction of three sets of steel tubes. When steam is applied, the tubes expand and separate the flanges, thereby freeing the goggle plate for swinging to open or closed position. When steam is removed, normal cooling contracts the tubes, which then clamp the flanges together to form a gas-tight leakproof seal. Can be hand-operated in case of steam failure.

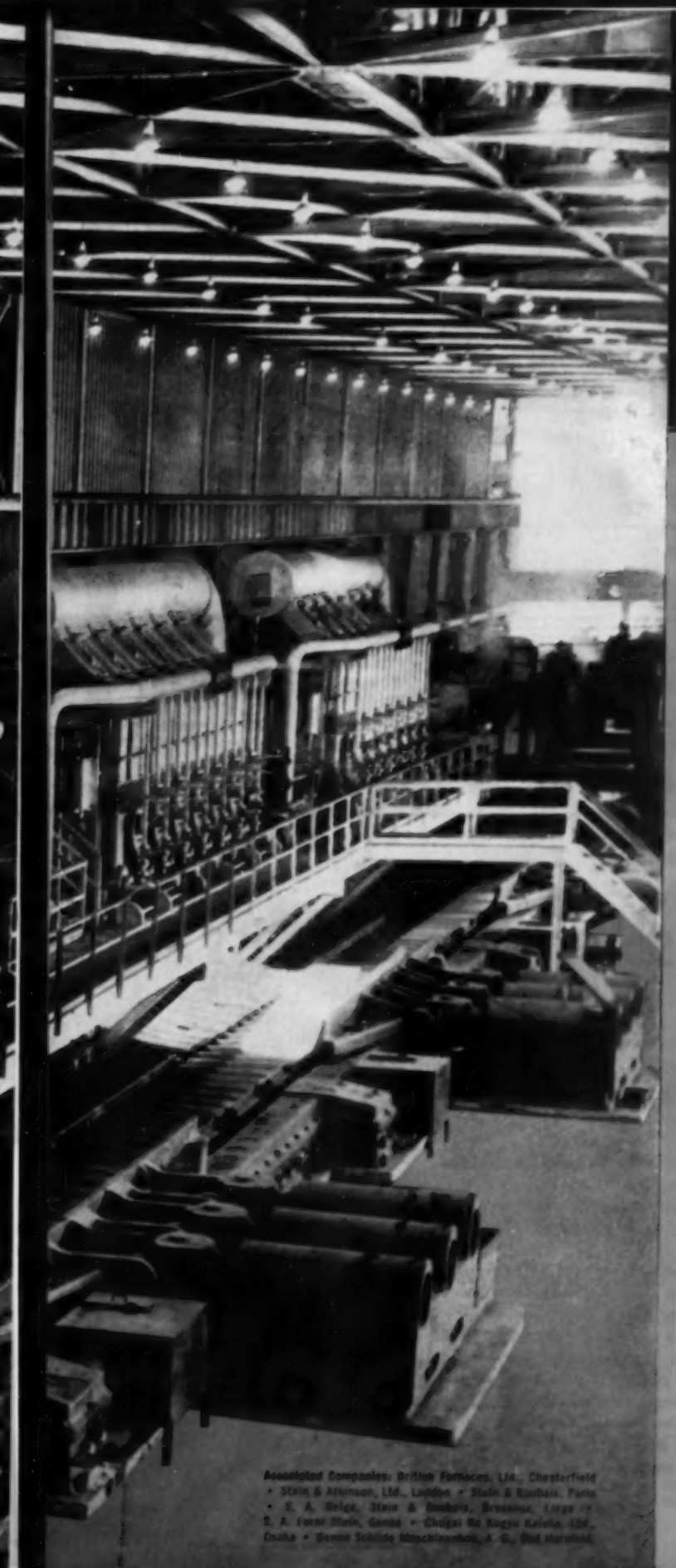
WILLIAM M. Bailey COMPANY

ENGINEERS

LEADERSHIP THROUGH QUALITY

1221 BANKSVILLE ROAD PITTSBURGH 16, PA.





Associated Companies: British Furnaces, Ltd., Chesterfield • Stein & Atkinson, Ltd., London • Stein & Roubaix, Paris • S. A. Belge, Stein & Roubaix, Bressoux, Liege • S. A. Forni Stein, Genoa • Chugai Ro Kogyo Kaisha, Ltd., Osaka • Benno Schilde Maschinenbau, A. G., Bad Hersfeld

200 TONS AN HOUR

CONTINUOUSLY

200 tons of steel slabs are heated to rolling temperature every hour, continuously, in each of these Surface monsters—world's largest slab furnaces.

No other furnace today can list all of these features:

1 Cantilever skid supports* permitting unobstructed combustion space for underfiring.

2 Furnace lines and burner design which provide high heat input from the moment the slab enters the furnace.

3 Built-in control* to prevent intermingling of gases from upper and bottom zones, providing better control of heat application, and preventing overheated slab end.

4 Anticipatory control which reduces temperature head when rate of slab discharge decreases.

5 Air preheat up to 1100°F.

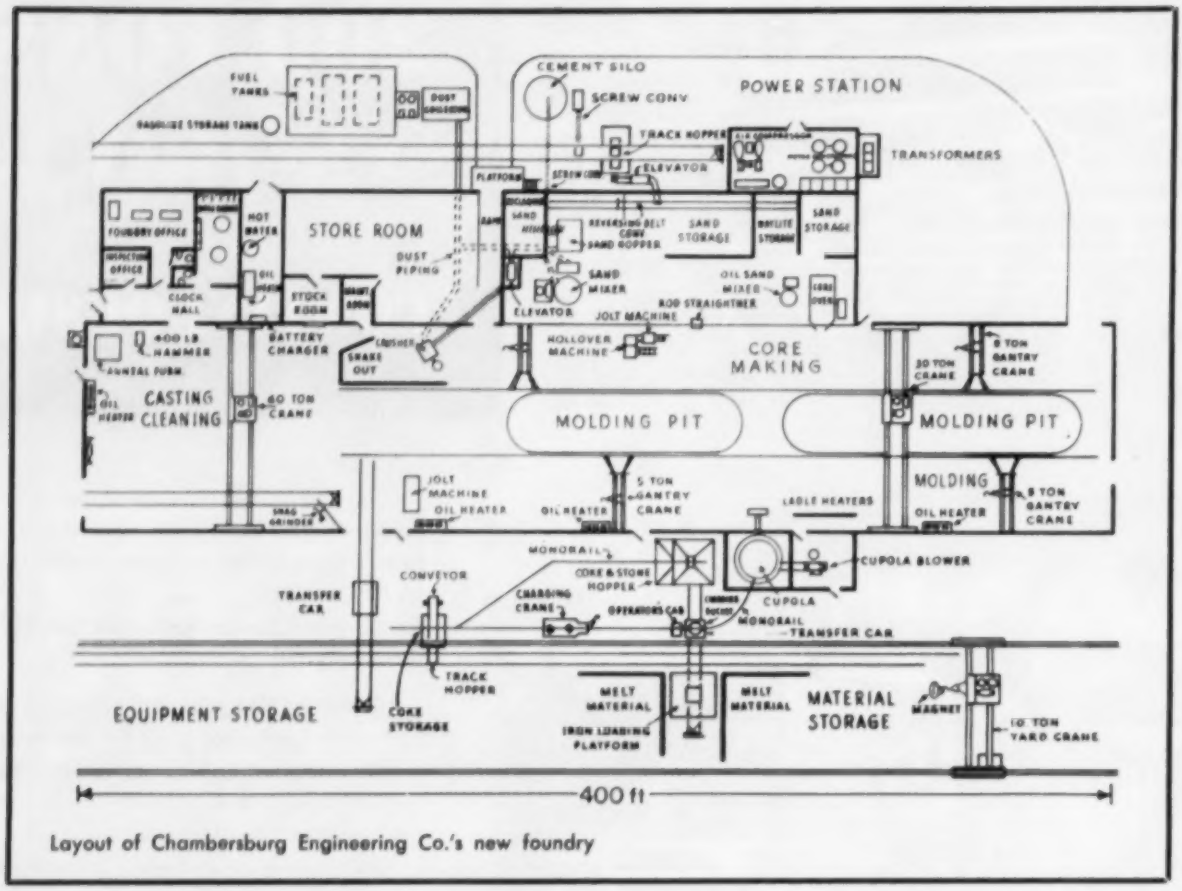
6 Television signal to pusher pulpit, informing operator of the exact position of the leading slab.

About the only conventional feature in these giants is the fact that the slabs are pushed in one end and out the other.

This is another demonstration that, at Surface, unconventional thinking and conventional experience are a productive team for the steel industry. Surface Combustion Corporation, Toledo 1, Ohio.

*patents pending

Surface
STEEL MILL EQUIPMENT



Layout of Chambersburg Engineering Co.'s new foundry

Big Castings Build a Business

Customers were knocking on the door when Chambersburg Engineering Co. opened its $1-million dollar foundry for big cement mold iron castings

IN AN AGE of diversification, miniaturization and mass production, the foundry arm of the Chambersburg Engineering Co., Chambersburg, Pa., took stock of the trends—and went the other way. It is pouring its long experience with big iron castings into more and bigger of the same.

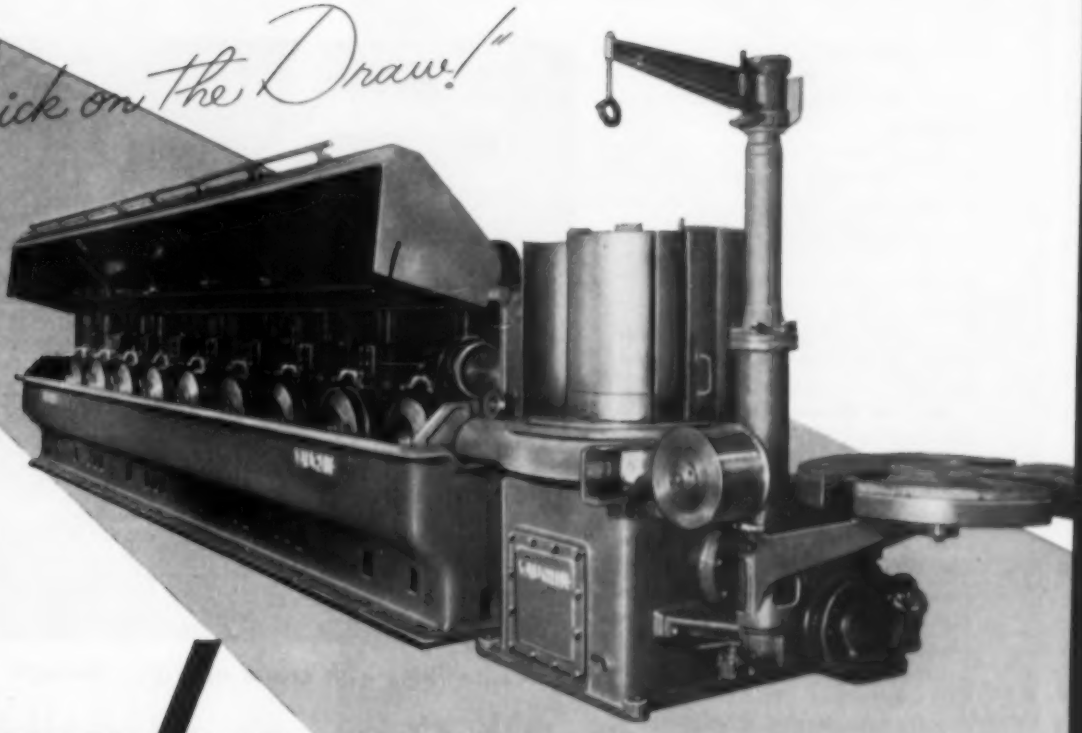
Evidence of faith in big iron castings is the company's new $1-million foundry. It is mechanized to a degree that produces efficiency and economy without loss of versatility. Versatility becomes imperative when castings range from 1000 to 150,000 lb, are poured in gray, alloy and ductile irons, and jobbing is 50 per cent of the business.

Customers — That 50 per cent figure is a pleasant surprise. Chambersburg has long made castings for its forging hammers and presses. The company figured that 70 per cent of its casting production would be for home consumption; the remainder would be for a few selected customers it had served over the years.

But the word got around while the new foundry was still in the blueprint stage, and at the same time several suppliers of large castings withdrew from the jobbing market. As a result, Chambersburg has had to expand its intended market area several times beyond the 100-mile radius originally planned.

Cement Bond — Since 1936 the company has concentrated on the cement bonded sand method of casting. With the efficient sand system in the new foundry, vir-

"Quick on the Draw!"



Vaughn® HEAVY TANDEMS

for rapid size reduction of large-diameter rod in copper and alloys

Top efficiency is reached in reducing larger rod diameters with Vaughn slip-type, wet drawing heavy tandems. • Our standard tandems provide high speed reduction of ⅛" diameter aluminum and 5/16" copper to wire • Let us discuss the types and sizes of interest to your operations.

STANDARD TANDEMS

for high-speed drawing of aluminum and copper rod to wire sizes

The Vaughn MACHINERY COMPANY • CUYAHOGA FALLS, OHIO • U.S.A.

COMPLETE COLD DRAWING EQUIPMENT—Continuous or Single Hole . . . for the Largest Bars and Tubes . . . for the Smallest Wire . . . Ferrous, Non-Ferrous Materials or their Alloys.

BIG CASTINGS . . .

tually all the molding material is reclaimed.

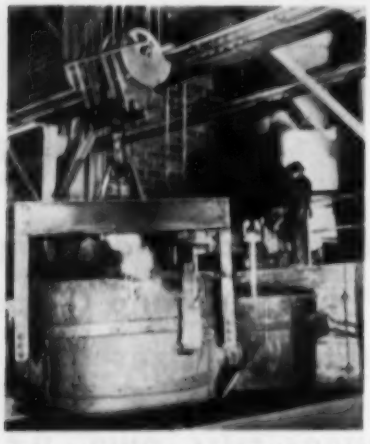
Cement molding makes possible close tolerances (within ⅛ in. across a 30 ft span) and produces minimum shrinkage problems. The strong bond resists distortion under the pressure of metal. No heat is required to dry the molds, and they generate practically no gas when in contact with the hot metal.

Molding Area—The foundry has two molding pits each 20 ft wide x 120 ft long. Largest flask size for floor molding is 8 x 10 ft; bigger work goes into the pits.

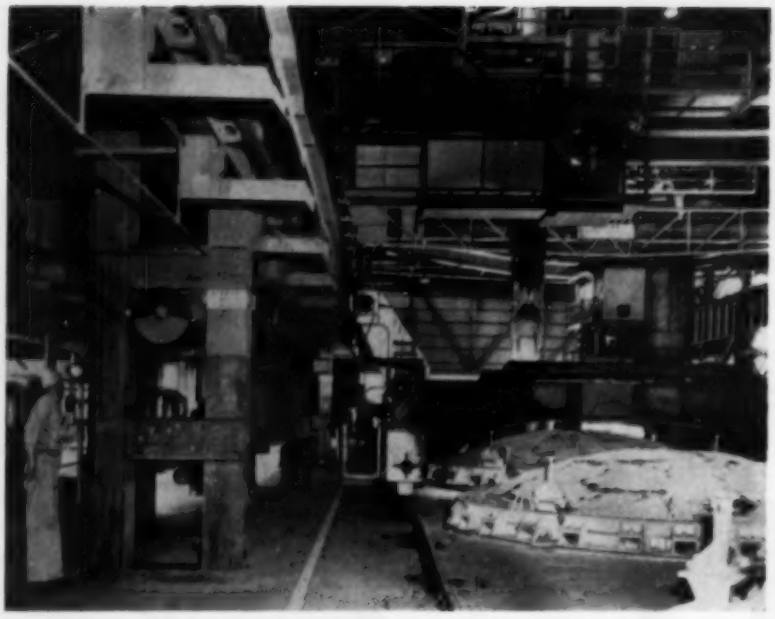
In addition to its own needs, the company makes castings for pumps, centrifugal blowers and turbine cases, condenser shells, planer tables, boring mill uprights, hydraulic rams, testing machines and locomotives. The big patterns require considerable storage space. About 700 are in active inventory and 7000 in inactive storage.

Hot Metal—Metal is melted in a conventional acid lined, continuous tapping cupola with a diameter of 78 in. inside the lining. It has a capacity of 40,000 lb an hour, more than sufficient for the 1-million pounds of castings poured monthly.

The bottom drop doors on the cupola open to the outside of the building to permit cupola clean-up without disturbing operations inside. Among other advantages, the new cupola has taken over the work of six former melting units.



Tapping the new cupola at Chambersburg's foundry for big castings



Foreman talks with crane operator through . . .

Crane to Floor Radio

HAND and whistle signals have fallen prey to progress at Sheffield Steel Division, Armco Steel Corp., Kansas City, Mo. An FM radio system that uses existing electrical circuit for transmission makes it possible for workers to communicate without interference or misunderstanding.

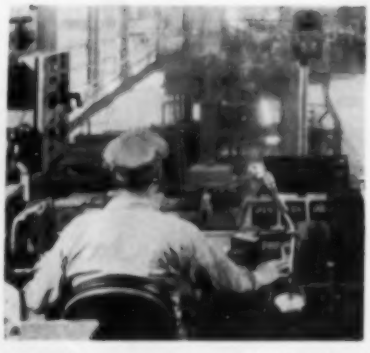
The Telecrane FM carrier system includes: In the soaking pit area, three stations in crane cabs, a base station and a remote station; in the blooming mill area, a crane cab station and a base station.

Equipment — Each mobile or crane station has a loudspeaker, an adjustable microphone and a foot switch (to close the circuit). Each base or ground station has a microphone-speaker, with switch.

Men in the pulpit of the blooming mill notify crane operators when to draw an ingot from the soaking pits. Timing is vital. Ingots must be drawn quickly to eliminate delay in rolling. Allowing the ingot to cool would mean reheating operations.

Co-ordination—Sheffield is amplifying the signals. The foreman in the soaking pit area can hear conversations between crane operators or blooming mill operators at the crane station. Results: Clearer understanding of orders, greater safety, better co-ordination of operations and speedier production.

The Telecrane, made by Mine Safety Appliance Co., Pittsburgh, is free of transmission noise and outside interference.



Microphone in crane cab has foot switch. Operator's hands are free

on this 1941 model
the stainless steel
trim is

still bright and handsome!

after 15 years
of continual use
and exposure

The photographs of the car are unretouched

yes- Stainless Steel

serves best on any automobile!

Fifteen long years . . . but only a good start in life for ever-bright *stainless steel* — the beautiful metal that outlasts the car! • Today's automotive stylists specify stainless for its *service-proved* strength and corrosion-proof brilliance, and a substantial portion of the industry's orders for stainless calls for coils of SUPERIOR Stainless Strip Steel — precision made, uniform in every desired composition, temper and finish.

Superior Steel
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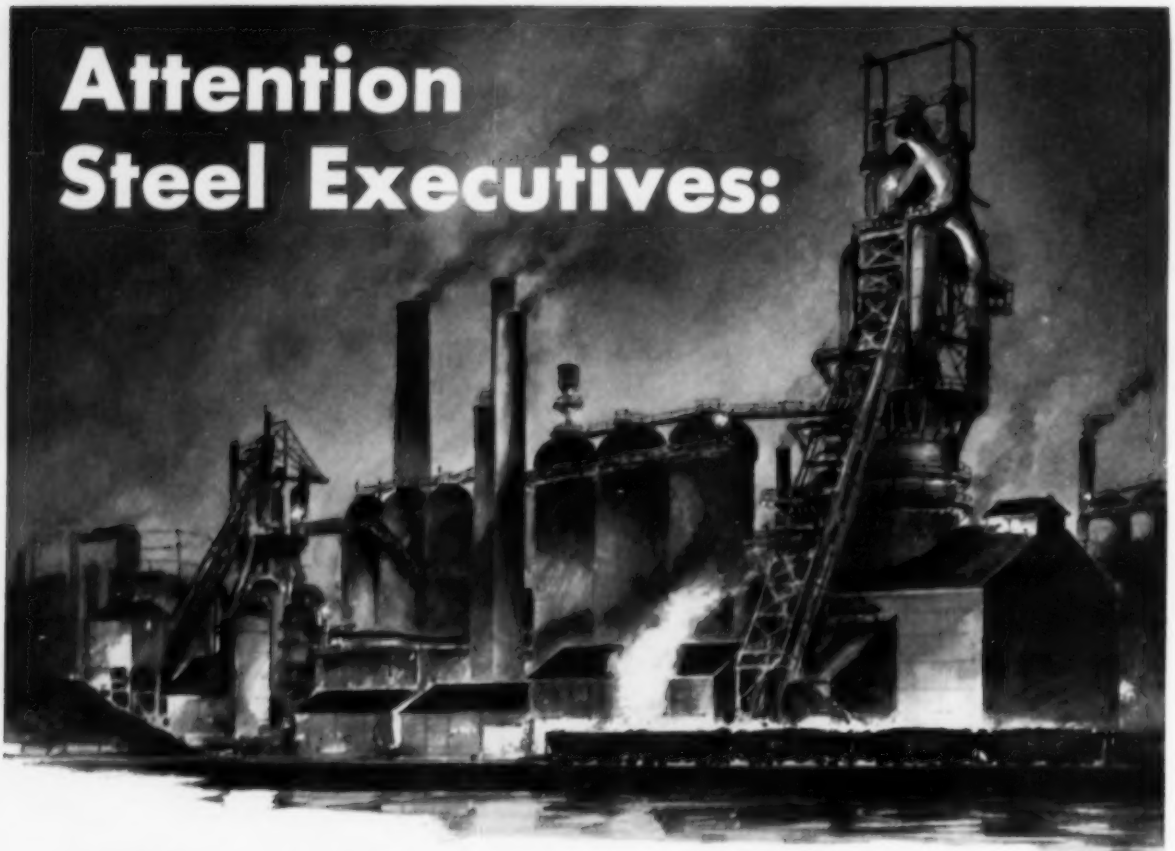
CARNEGIE, PENNSYLVANIA

Attention Steel Executives:



for Ore, Coal, Limestone, Water . . .

along the Norfolk and Western is the plant site for you!

You can build a steel mill along the N&W and be "next door" to coal and limestone. You can build directly alongside the water you need. You can avail yourself of short-haul advantages in transporting ore from the big, modern Port of Norfolk.

The coal is the world's finest Bituminous, and the supply is virtually unlimited.

The limestone is top-grade . . . dolomites and high-calcium . . . the largest sources east of the Mississippi.

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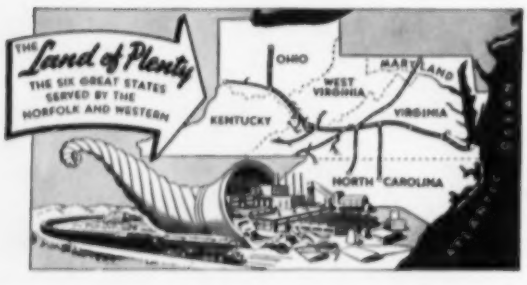
We have *eye-opening* data on exceptional location advantages for steel mills. WE *INVITE YOU TO CONFIRM OUR FINDINGS.* Our plant location specialists will work with you in confidence and without obligation.

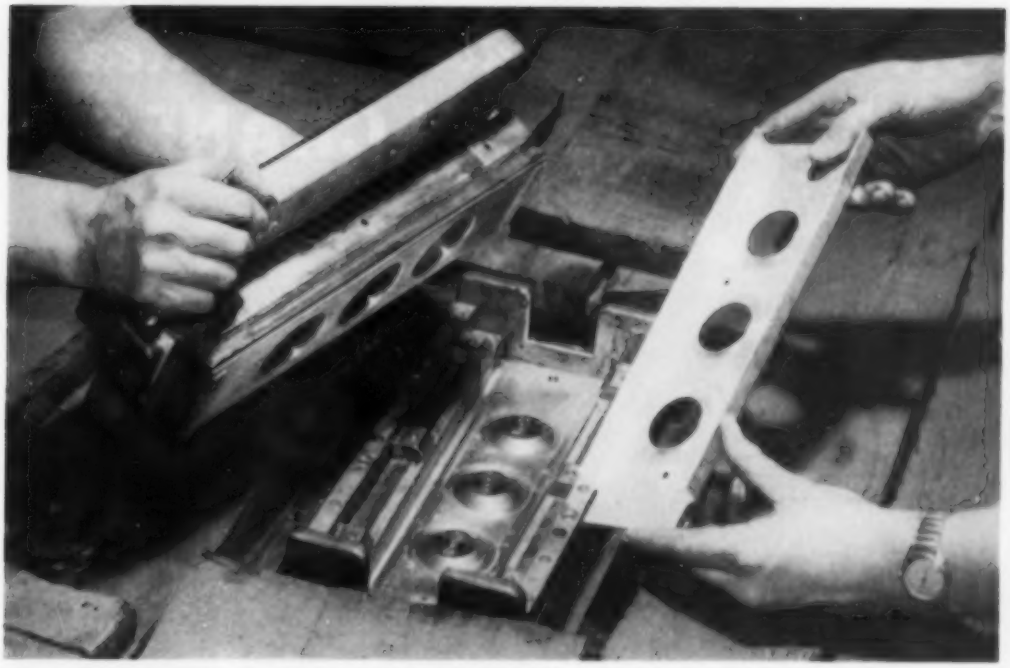
The advantages outlined are exceptional. Investigate them.



Write, Wire or Call:

L. E. WARD, JR., Manager
INDUSTRIAL AND AGRICULTURAL DEPT.
Drawer S-724 (Telephone 4-1451, Ext. 474)
Norfolk and Western Railway
ROANOKE, VIRGINIA

Norfolk and Western RAILWAY



Operators have just formed a small, intercostal wing stiffener. Rubber punch forms; steel punch produces permanent set by contacting flange edges

Rubber Forming Gains Accuracy

Standard rubber forming techniques are improved with compression forming. At Lockheed the method produces stamped aluminum parts accurate to plus or minus 0.010-in.

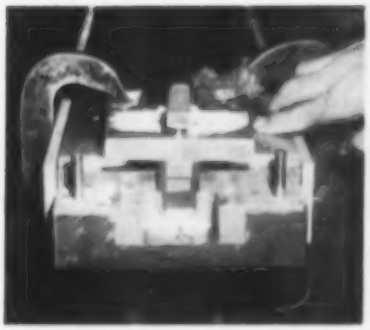
A VARIATION of rubber forming called compression forming is producing more accurate parts for supersonic aircraft. The method utilizes the plastic range of metal grains to reduce springback.

Engineers at the Lockheed Aircraft Corp., Burbank, Calif., who developed and patented the process, say they get these results: Sharper radiuses, narrower joggles, smoother contours which reduce drag, smaller blanks. In addition, fewer man-hours are required to make the parts.

Presses — Compression forming can be done by any of several commercial presses. Aluminum blanks are first preformed to broad tolerances at 1000 psi. After preforming, joggles are defined and flange waves removed by hand. The preformed part is then shaper-sawed to establish a uniform flange width.

Before the final sizing operation, parts are heat treated at 925°F for 30 minutes and quenched in cold water. This puts the aluminum in a temporary malleable condition.

Die — The compression method uses a die with two parts—a rubber faced punch and a thin metal punch which contacts the flange edges. The part is placed in the die and the punch lowered. At 1000 psi the rubber pad forces the metal against the die contours. A fraction of a second later, the thin metal punch contacts the edge of the flanges. The metal-to-metal contact is the compression or "set" that gives parts their accuracy.



Cutaway view of the die used in compression forming. Rubber-faced punch is in position

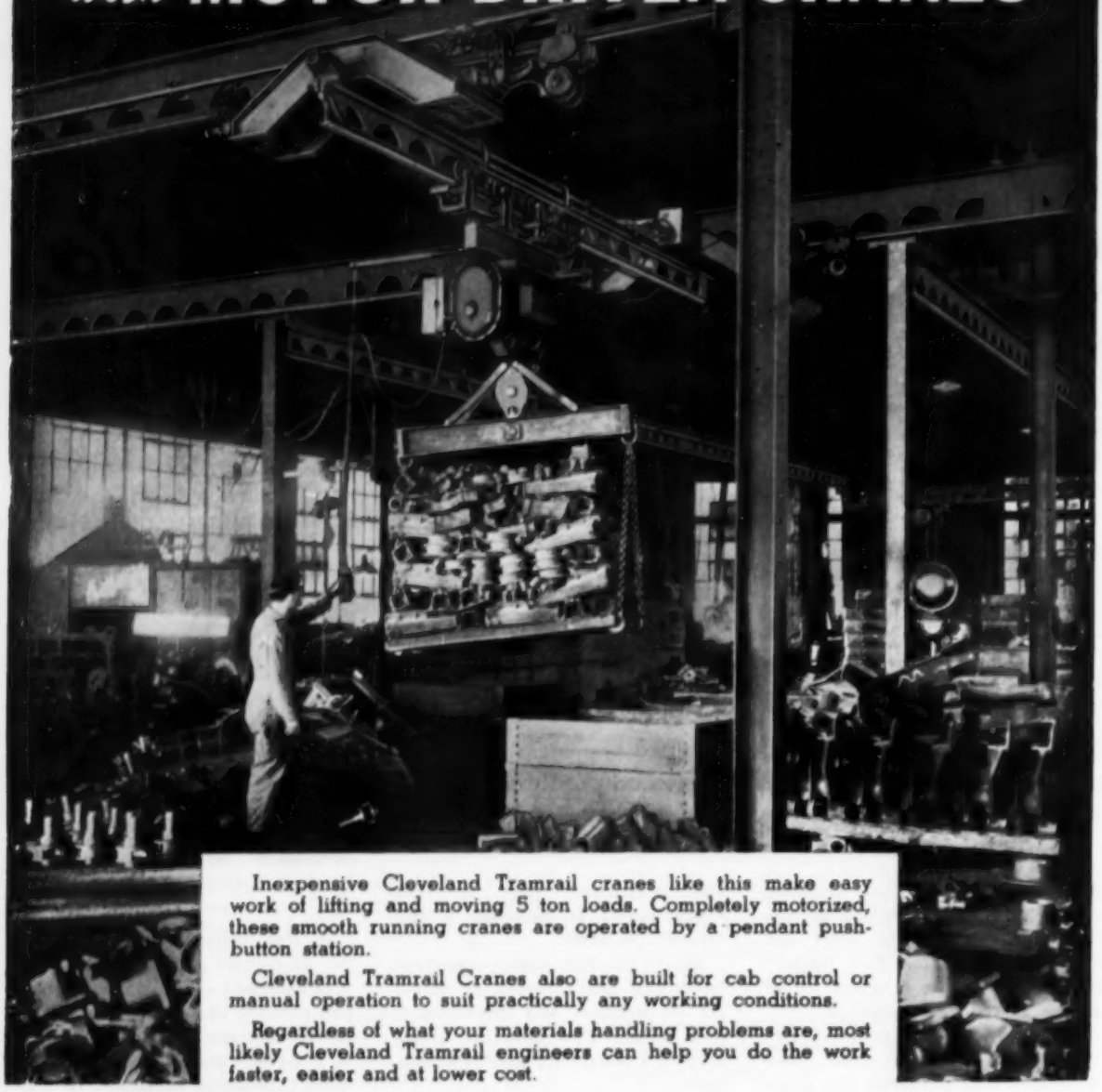
A final artificial aging leaves the aluminum at 72,000 psi.

Comparison — Standard rubber-pad forming at Lockheed produces parts that are accurate to 0.032-in. After parts are removed, hand forming is necessary to correct slight inaccuracies, deepen embossments, set flanges to the proper angle and the like.

The compression method eliminates most of the hand finishing formerly required. Savings vary with the complexity of the part. The example in the illustration above saved 15 per cent.

Tolerances are much closer. Experience so far has shown that most parts can be held within plus or minus 0.010-in.

5 TON LOADS *Easily Handled with* MOTOR-DRIVEN CRANES



Inexpensive Cleveland Tramrail cranes like this make easy work of lifting and moving 5 ton loads. Completely motorized, these smooth running cranes are operated by a pendant push-button station.

Cleveland Tramrail Cranes also are built for cab control or manual operation to suit practically any working conditions.

Regardless of what your materials handling problems are, most likely Cleveland Tramrail engineers can help you do the work faster, easier and at lower cost.

GET THIS BOOK!

BOOKLET No. 2008. Packed with valuable information. Profusely illustrated. Write for free copy

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THE CLEVELAND CRANE & ENGINEERING CO.
7807 East 284th Street, WICKLIFFE, OHIO.

CLEVELAND TRAMRAIL
OVERHEAD MATERIALS HANDLING EQUIPMENT

TV Eyes Furnaces

Closed-circuit TV provides operators with third eye in two steel processing operations

CLOSED-CIRCUIT television lets operators 150 ft away "see" and control processing operations inside reheating furnaces at Weirton Steel Co., Weirton, W. Va.

A second RCA TV installation enables operators up to 350 ft away to observe and control steel slabs in transit on roller tables from the roughing to finishing departments.

TV Watch—In the reheating application, there is a camera at the side of each of three reheating furnaces, a few feet from the exit. Each camera peers through a small hole in the furnace and scans the hearth at the point where it meets the furnace discharge chute.

When a new slab is ready, the operator opens the entry door of the furnace. The TV camera at the exit end of the furnace is activated automatically, and its pictures are switched on the operator's monitor. Watching the monitor, the operator pushes the heated steel slab at the exit end into the discharge chute, and moves the others forward to make room for the incoming entry slab.

ENCASED CAMERA
. . . peers inside reheating furnace

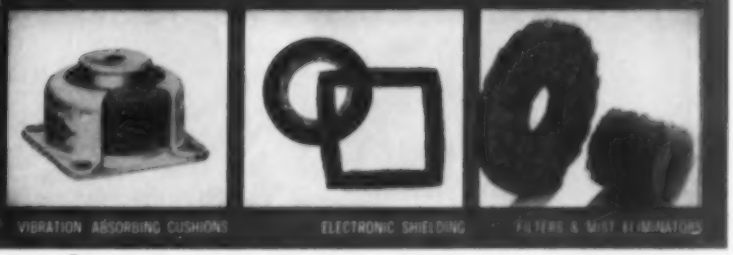
Guided by his TV picture, the operator positions the new exit slab so that it is at the edge of the hearth, but still in the uniform heating area.

Heat Shields—Because the furnaces heat the slabs to about 2000°F, the cameras must be shielded. Each is encased in a special metal box with a conditioned air system.

The camera that scans the roller table also is heat protected.

Engineers have taken to **KNITTING** with **ALLOY WIRE**...

Look at the results they're getting...



If you haven't started to investigate the design potential for knitted stainless steel and nickel alloy wire, now is the time to do it. Here are some interesting applications to whet your interest and imagination:

1. **VIBRATION & SHOCK ABSORBING CUSHIONS**—used to protect intricate, expensive electronic equipment in aircraft. Alloy wire is unaffected by high temperatures, low temperatures, moisture and other elements.
2. **ELECTRONIC SHIELDING**—knitted alloy wire gaskets eliminate radio interference in electronic equipment. Nickel alloy wire has good conductivity, corrosion resistance and resiliency.
3. **FILTERS & MIST ELIMINATORS**—knitted wire pads remove entrained liquids from gas streams with exceptionally low pressure drop. Shaped cartridges widely used for oil and other liquid filters.

Many other industrial applications take advantage of the outstanding properties of knitted alloy wire. Learn more about these interesting products . . . send today for Application Bulletin A-1.

ALLOY HKP

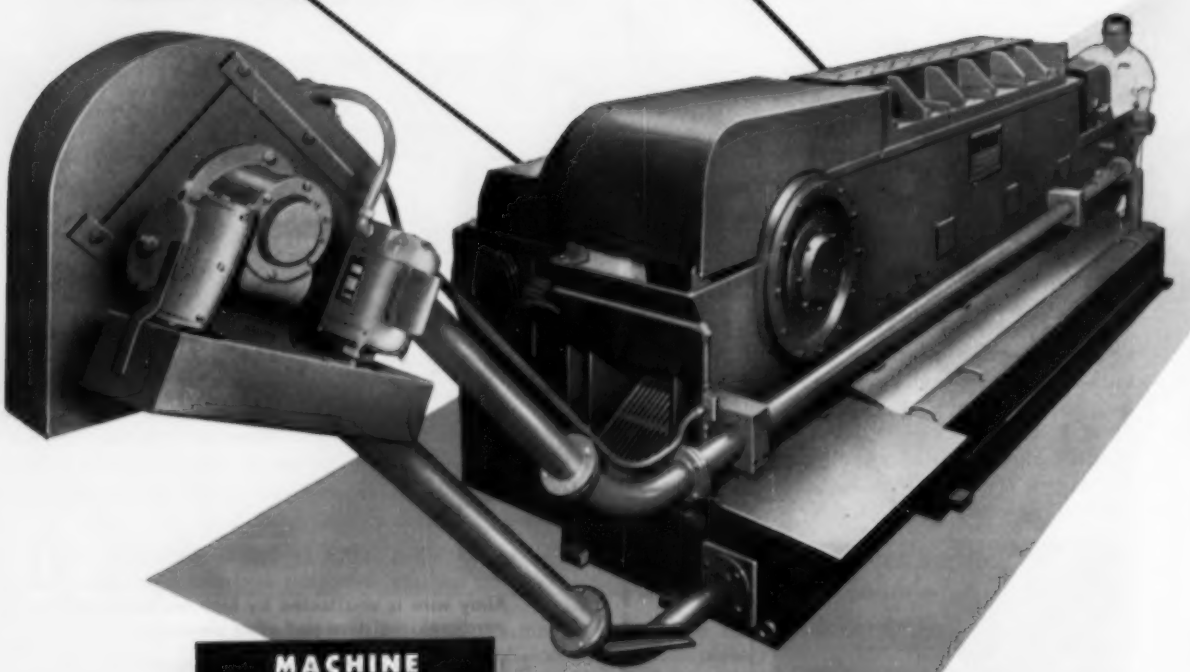
ALLOY METAL WIRE DIVISION

H. K. PORTER COMPANY, INC.
Prospect Park, Pennsylvania

NEW DETROIT Continuous

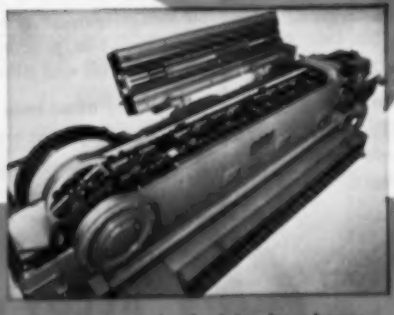
BULL GEAR
1/2 TON

BROACH TUNNEL
13/4 TONS

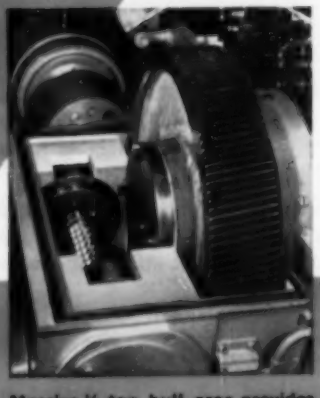


MACHINE
171/2 TONS

Note generous radius from chain axle to outer machine frame, 22½" at loading end, 23½" at unloading end. This assures easy, safe handling of wide variety of work sizes and shapes.



Broach tunnel raised to show heavy duty twin chain type drive and automatic hammer lock fixtures. Tunnel and broaches weigh 3,750 lbs., while entire machine weighs 35,000 lbs.



Massive ½ ton bull gear provides positive pulling power and smooth operation required for extremely fine finishes. Gear is directly connected to main drive drum.

BROACH
Horizontal Machine

WEIGHT *where you want it!*

ROOM *where you need it!*

Extreme weight and rigidity are the answers to high-production surface broaching with fine work finishes and long tool life . . . and this husky new Detroit Continuous Horizontal gives you *the most you can get!*

PLUS

- Generous loading and unloading clearances for easy, safe handling of a wide variety of work.
- All-welded, heavy steel plate frame.
- Fully automatic fixture locking, machine operation and unloading.
- Safety interlock assures proper work positioning before operation.
- Heavy-duty, twin chain electric-mechanical drive.
- Simple change gears for varied cutting speeds.
- Entirely self-contained, including automatic chip disposal unit.
- Electric and hydraulic equipment to J.I.C. standards.

Model illustrated is 90" stroke 15-ton capacity with cutting speeds to 40 f.p.m. Other 15-ton models available with 66" and 120" stroke, lower and higher tonnage capacities on request. Send part prints for prompt recommendation and quotation, or mail coupon now for free descriptive literature.

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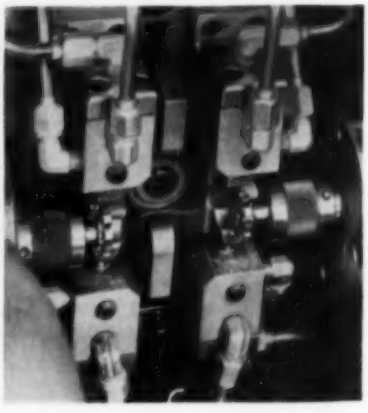
Mills Auto Parts

A boring machine to mill both ends of the workpiece at once fills a production need

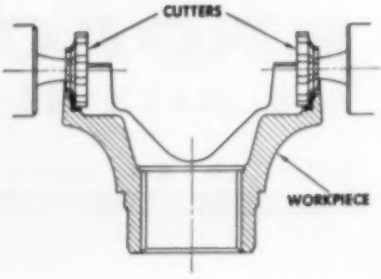
MILLING both ends at once can mean double production. Take this Ex-Cell-O boring machine. It doubled production in the milling of a steel propeller shaft pinion flange.

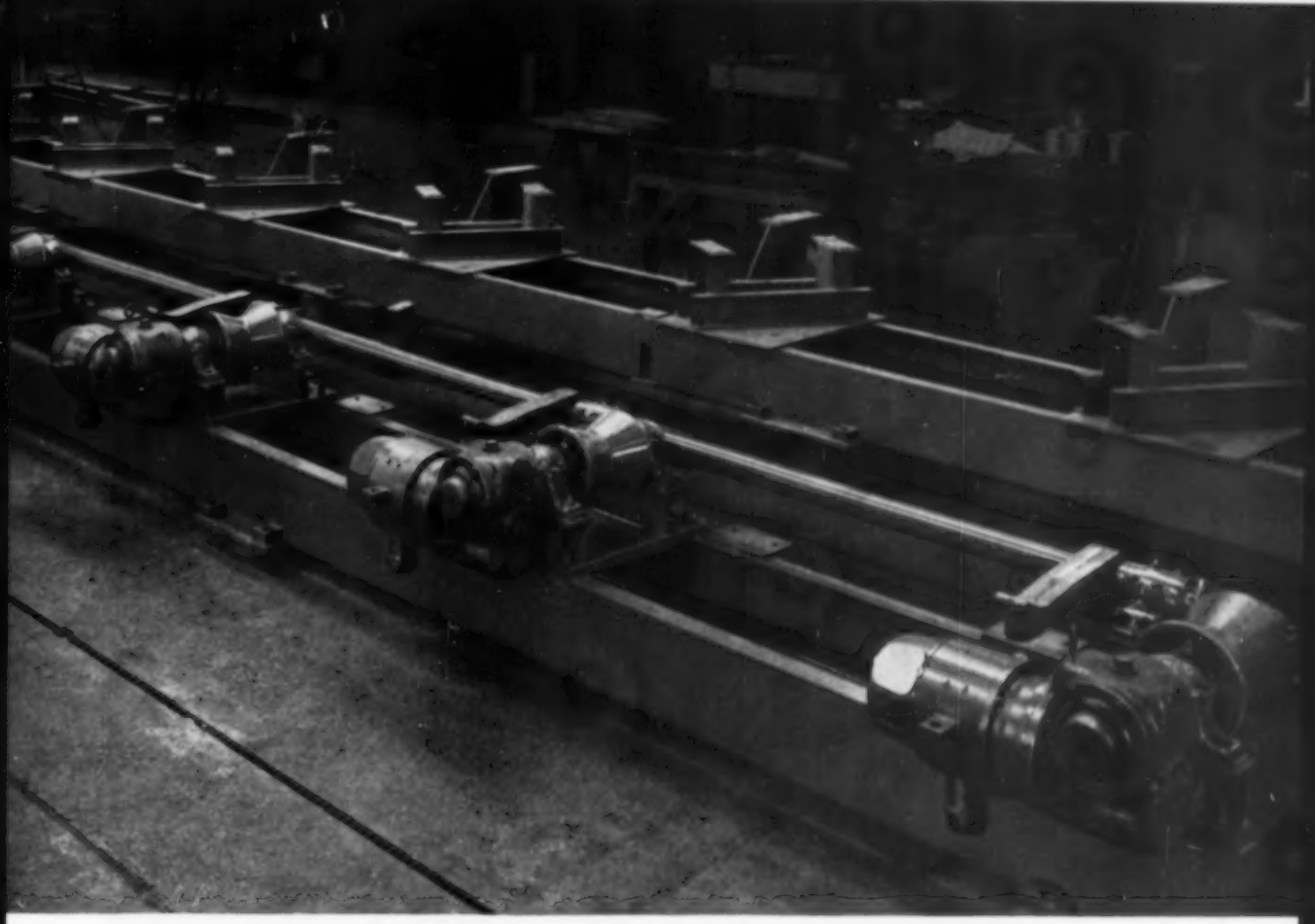
Machining operations consist of facing and undercutting with milling cutters at two places on each part. A basic boring machine was adapted, with extra-wide bridges for transverse mounting of the spindles. The arrangement provides for both automatic and manually controlled operation.

As one part is loaded into the holding fixture, another is being machined. Production rate is 188 an hour. The workpiece is held in position by hydraulic clamps which are controlled by pushbuttons. Safety devices prevent operation if a part is improperly loaded or clamped.



Close-up of the propeller shaft pinion flange. In the diagram (below), the heavy areas show the cuts. Table feeds the work





FACT: New floating roll-table drive solves space, shock, maintenance problems

Basic facts show how Westinghouse floating gearmotors bring greater efficiency and economy to roll-type conveyor operations:

FACT 1: Space needs minimized by compact drive design
Shaft suspension of drive and absence of separate coupling give maximum spacesaving and assure greater operating safety.

FACT 2: Roll shocks cushioned by spring mounting
Spring mechanism on anchor arm and "on-shaft" mounting enable this gearmotor to withstand shocks and stresses from roll eccentricity.

FACT 3: Maintenance reduced by drive simplicity
Absence of couplings, simple yet rugged gear arrangement and integral design of over-all unit all combine to cut maintenance needs to the minimum.

For more facts on this or any Westinghouse gearing equipment, call *The Man With The Facts*... he's the Westinghouse sales engineer at your nearest Westinghouse sales office! J-07543

A locking screw and clamping plate lock this compact gearmotor firmly to roll-table shaft. All power is transferred to roll shaft at low unit pressures.

WATCH WESTINGHOUSE!

WHERE **BIG** THINGS ARE HAPPENING **TODAY!**

The Wyman Gordon Co., Worcester, Mass., forges this chrome-molybdenum part at 2300°F in closed dies made of beryllium-copper inserts in holders of chrome-molybdenum-vanadium. Forging is 2 in. x 4 in., weighs 4½-lb. Die closure tolerance is 0.030 to 0.040-in. Impact pressure exceeds 2000 lb

Beryllium-Copper Dies

If you forge, press, extrude, mold or diecast, consider the advantages of a castable die that conducts heat well, resists wear, is hard (Rc45) and strong (170,000 psi)

WHY NOT cast the die instead of hobbing or sinking it? For short to medium production runs, beryllium-copper dies are cheaper to make, can be remelted and used again, says the Beryllium Corp., Reading, Pa.

It doesn't matter whether the material is metal or plastic or whether the operation is forging or deep drawing, beryllium copper does a good job, sometimes better than tool steel. One manufacturer says that he deep draws stainless with far less pickup on the radius, gets better wear and resistance to galling.

Character—Beryllium copper can be precipitation hardened up to Rockwell C45. Tensile strengths top 170,000 psi, yet the castings don't suffer from low temperature embrittlement — ductility and impact strength remain good down to —300°F.

Such dies are good for uses involving heat. The thermal conductivity of beryllium copper is second only to copper itself. It resists corrosion, wears well (is a good bearing surface), is nonsparking and nonmagnetic.

The material has excellent casting qualities. It flows well when molten and reproduces the details of ornaments and intricate designs. Pouring temperatures are relatively low, and any of the normal casting techniques — sand, permanent mold, centrifugal, plaster or investment — produce good results.

Alloys—There are two groups of casting alloys. The first has high strength and hardness, conducts electricity and heat well, contains 2 per cent or more beryllium and is used where strength, hardness and wearing qualities are essential.

The second group contains about 0.5 per cent beryllium and higher amounts of cobalt and silver. These alloys are recommended for uses requiring greater electrical and heat conduction than the first group. (Compositions are in accompanying tables.)

Forging—An aircraft manufacturer needed a less expensive die material for short production runs of steel forgings. It found that beryllium copper was the answer,

Heat Treatment of Beryllium Copper, Casting Alloys

BERYLCO #	20 cr	275 cr	10 cr	50 cr
Composition(%)	Beryllium 2.0-2.25 Cobalt 0.35-0.65 Copper Balance	Beryllium 2.60-2.85 Cobalt 0.35-0.65 Copper Balance	Beryllium 0.55-0.75 Cobalt 2.35-2.70 Copper Balance	Beryllium 0.40-0.65 Cobalt 1.40-1.70 Silver 1.00-1.20 Copper Balance
Solution annealed as cast 3 hr.	1475-1500°F.	1475-1500°F	1675-1700°F.	1675-1700°F.
Hardening temperature	650°F	650°F	900°F	900°F
Minimum Rockwell Hardness	C 38	C 42	B 92	B 92
Ultimate Tensile Strength psi (min)	155,000	150,000	95,000	95,000
Remarks	Use for strength, hardness & wear. For forging, drawing aluminum, magnesium, alloy & stainless steel		Has better heat & electrical conductivity than first group. Use for plastics & die-casting. Chrome plate if used with zinc	

and it was pleasantly surprised to learn it worked just as well for longer runs with aluminum and magnesium. It also found that the material worked well for hydraulic press dies where dwell time was 15 seconds or more.

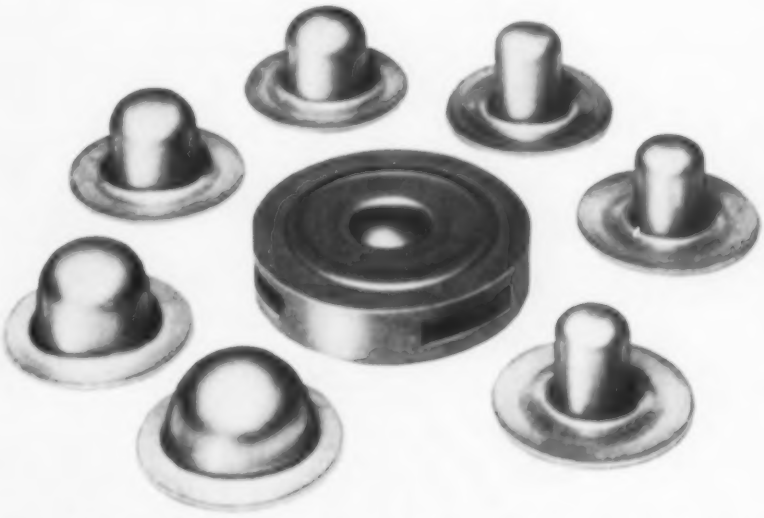
Forging dies for aircraft parts are usually made from a casting alloy with 2 per cent beryllium and 0.35 to 0.65 per cent cobalt, overaged to a hardness of Rc 35-38. Such dies are tough and easily form 75S and 14S aluminum and AZ80A magnesium. Shorter runs of 8615, 4340, 1027 and 1090 steels are also successful. One user reported a run of over 11,000 forgings of 8615 steel before the die wore out.

Forming and Drawing—Galling, seizing and tearing are the major die problems in deep draw and forming operations. If the part can be drawn at all, proper lubrication and reworking of the dies overcome these difficulties.

In all drawing operations, dies become heated from the friction of drawing or forming. The heat can be severe enough to crack the strongest steel dies. Beryllium copper is a good heat conductor and forms an excellent bearing surface that helps lubricants do their job.

An example is stainless steel drawing. A cup maker found it had to polish each cup to eliminate the drawing die marks. A beryllium-copper die eliminated the polishing operation and lasted longer. Die heat-up was greatly reduced.

For drawing stainless steel,



Some of the more refractory grades of stainless tend to stick and gall on tool steel dies. This cup was drawn on beryllium-copper dies without annealing

THE YOUNGSTOWN SHEET & TUBE COMPANY

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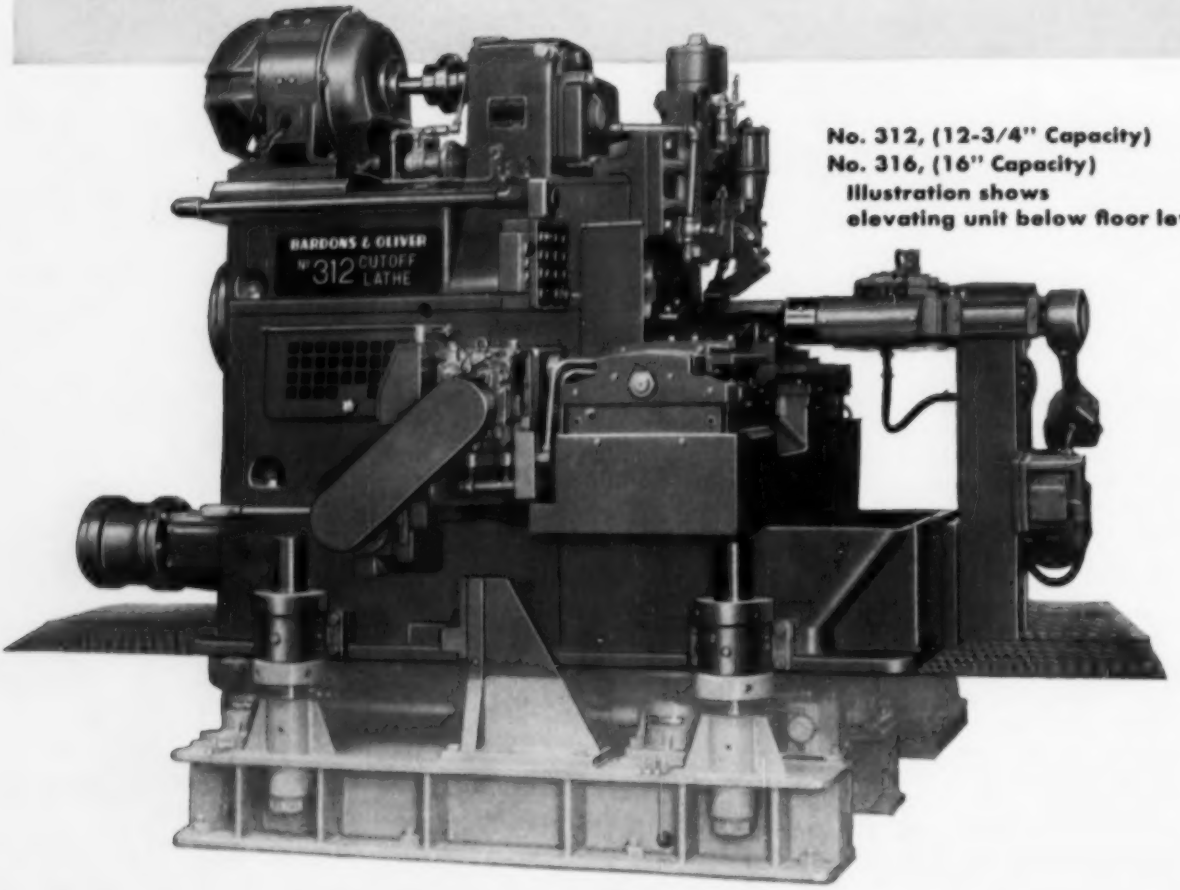
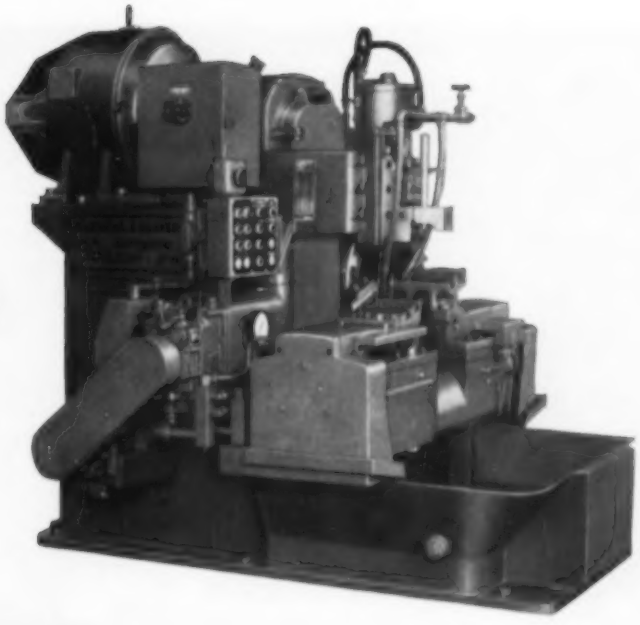
Cutting-off Lathes since 1926



No. 312, (12-3/4" Capacity)
No. 316, (16" Capacity)
Illustration shows elevating unit below floor level

No. 38, (8-5/8" Capacity)
No. 39, (9-5/8" Capacity)



No. 35, (5-1/2" Capacity)
No. 36, (6-5/8" Capacity)

Delivery of eight *new* Bardons & Oliver Cutting-off Lathes to The Youngstown Sheet & Tube Company will bring the total number in operation to over thirty machines. The Cutting-off Lathes at The Youngstown Sheet & Tube Company range in capacities from 5-1/2 inch to 14 inch diameter.

This large installation certainly represents a vote of confidence for the excellent performance of Bardons & Oliver Cutting-off Lathes... and speaking of confidence, many of the world's leading pipe and tube mills are standardizing on Bardons & Oliver machines. High rate of production, ruggedness, versatility and low maintenance cost make them industry's first choice. In addition to the six sizes illustrated we also manufacture 2", 3" and 4" capacity machines. For complete Cutting-off Lathe information, write us on your company letterhead.

Manufacturers of a complete line of
Turret Lathes and Cutting-off Lathes.

BARDONS & OLIVER, INC.

1147 WEST 9TH STREET • CLEVELAND 13, OHIO

Intricate die designs are easily cast with beryllium copper. These are some typical plastic molds

beryllium copper is used in the solution annealed condition and machined to specifications. Heat treatment (precipitation hardening) leaves the material about Rc 42-45. Dies are polished in the drawing direction with crocus cloth.

Any die will handle sheet thickness from 0.32 to 0.93 in. by merely changing the punch. Most users are reporting that for deep draws wall thickness is more uniform and consistent.

Titanium — Beryllium-copper dies draw titanium quite well. Where there is a wiping, sliding or drawing action, the dies are showing great promise. There is no apparent galling or seizing in pure titanium (AMS 4900, 4901), when formed at 500 to 600°F, or on alloy titanium (AMS 4908), when formed at 900 to 1000°F.

Titanium has less springback if formed at the higher temperatures. The high conductivity of beryllium copper is a natural for preheated dies. Instead of machining holes for preheating elements, stainless steel tubes can be cast directly into the die.

Zinc Diecasting—You can use beryllium copper for a diecasting die. Several have found it works well if you chrome plate and harden the cavities to prevent fusion with the zinc alloy. One diecaster says that his dies are still good after 300,000 shots and he expects a million more before they wear out.

Plastics—Instead of hobbing the decorations, embossments and sharp corners, a simple pattern can be used over and over again to produce cavities. When the cavities wear out, they can be remelted with virgin metal.

The material is good for quick-cooling injection molds or hand-operated hydraulic presses where rapid heating and cooling are important. Single-shot dies can be run with a shorter mold cycle.

The material stands the repeated shocks of a molding press without breakdown. One user says that he has made a million and a half shots with polystyrene and there is no evidence of wear.

Caution—In case of mold discoloration, chrome plating is successful. The silicone rubbers do not affect beryllium copper, but natural rubber or other high-sulphur materials cannot be molded.

• An extra copy of this article is available until supply is exhausted. Write Editorial Service, STEEL, Penton Bldg., Cleveland 13, O.

Studies Fatigue

Communications research shows a connection between internal friction and fatigue

WHAT happens inside when metals fail from fatigue is one of the latest results of communications research. Bell Telephone Laboratories, New York, studied the relationship of fatigue to internal friction. Conclusion: Any treatment of metal that will reduce the average length of Frank-Read dislocation loops will increase fatigue strength.

System—To measure the internal friction, W. P. Mason of the Laboratories used a barium titanate transducer matched to an exponential horn-shaped sample of the test metal. This served to concentrate large strains in the small, necked-down section. The internal friction, strain and change in elastic constants were determined from the driving voltage on the transducer and from a pickup electrode on the titanate.

The reversible increase caused by intermediate strains ties in with the reversible production of dislocation loops by the Frank-Read mechanism and agrees with the observed distribution of etch pits. Under large strains, the dislocation loops seem to expand irreversibly until they cut through restraining dislocations, producing jogs and vacancies in the metal lattice.

Hi-Temp Symposium

MOLYBDENUM and its alloys for high temperature applications are the subject of a Navy sponsored symposium to be conducted Sept. 18 and 19 in Detroit. Some 15 papers will be presented on molybdenum, ranging from its use as a structural material to applications in gas turbines.

The Climax Molybdenum Co. of Michigan will hold an open house on Sept. 20 to demonstrate the arc melting and working of molybdenum alloys.

Attendance is by invitation only. Write: Julius J. Harwood, Metallurgy Branch, Office of Naval Research, Dept. of the Navy, Washington 25.

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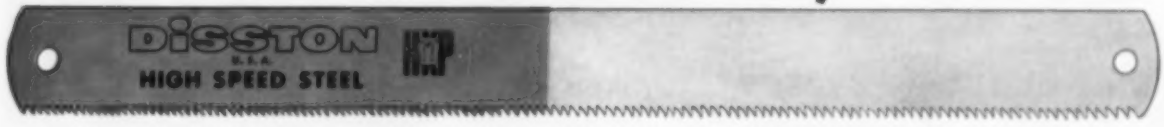
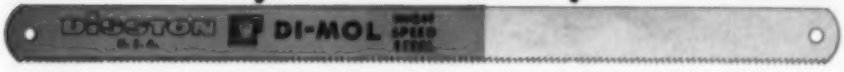
machine shop cutting

use one of these 8 sturdy



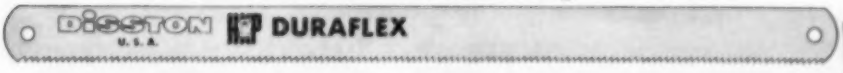
DISSTON HACK SAW BLADES

They cut easily . . . resist



wear and breakage. Get

them through your



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Simplifying the assembly line

A 3M adhesive is helping to create 50 shelves per hour right before your eyes. By bonding parts instantly, EC-1357 simplifies this assembly line to just four fast operations.

One worker puts metal frames and fiberboard sheets on a conveyor moving 9 feet per minute. The second sprays EC-1357 on both as they pass by. The third positions the boards on the frames. They pass under a pressure roller and the bond is complete. There are no extra fastening steps.

Instantly EC-1357 bonds board to frame so strongly that the fiberboard will delaminate if you try to remove it. A fourth man installs molding. The shelves are ready to ship immediately.

Hundreds of other 3M adhesives serve industry in a thousand varied uses.

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Continuous Broaching Machine Has Cutting Speeds Up to 40 fpm

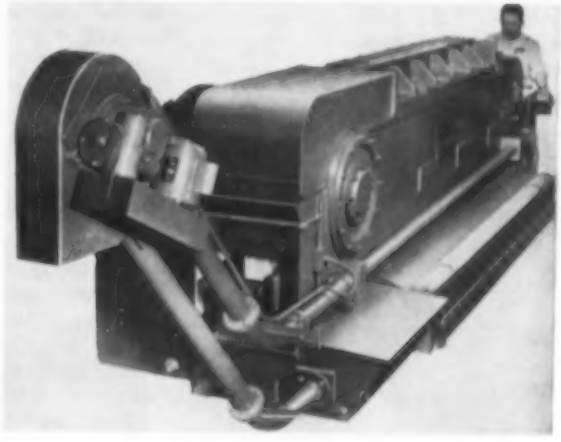
Fixture locking, operation and unloading of the horizontal broacher are fully automatic. When required, loading also can be done automatically.

Long broach life and fine finishes are made possible by the heavy, rigid construction of the machine. An oversize bull gear provides the positive pulling power, extra weight and smooth operation required for fine finishes.

A large radius from the chain axis to the outer machine frame gives extra clearance for easy, safe loading and unloading. The hammer-lock fixtures are automatically located, locked, opened and emptied. The number of fixtures can be varied to meet production requirements. A safety device prevents operation until parts are locked in.

A heavy-duty twin chain electric-mechanical drive gives cutting speeds up to 40 fpm. Other speeds can be obtained through simple change gears.

The machine is self-contained, including a filtered coolant tank, pumps and an automatic chip disposal



unit. The 15-ton broacher comes in 66, 90 and 120-in. models. *Write*: Detroit Broach Co., Rochester, Mich. *Phone*: Olive 1-9211

Only Main Gears Are Built Into the Crown of Basic Press Line

These eccentric-geared presses are built to simplify maintenance and allow the user to adapt a press to his needs.

The single-action, two-point presses have a quill-mounted flywheel and overhung clutch built into a unitized gear case on which the main motor drive is mounted. The entire drive can be removed from the press as a unit and reinstalled with a minimum of time and effort.

Other maintenance advantages: Belts can be replaced without moving anything but the break pins and the clutch can be taken off by removing the brake bracket. The quill assembly, clutch and all, is taken out of the gear case by removing six screws.

Standard features of the SE-2 line include all-welded construction, with a four-piece frame and tierods drilled for electrical shrinking. There is a recirculating oil system for gears, shafts, bearings, slide adjustment and flywheel roller bearings. Bronze liners on the slideways run against cast iron gibs.

Also provided are a motorized slide adjustment (motor and controls extra) and counterbalance tanks but no fittings.

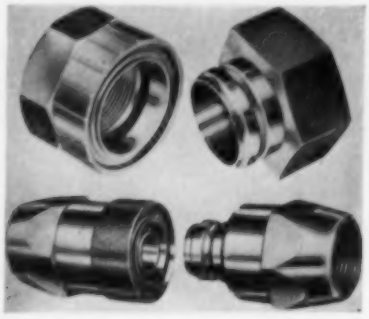
Special features that can be added (in whole or part) to the basic press include automatic controls and feeds, inbuilding, automatic lubrication, air and electrical outlets for maintenance tools, die lights, air control manifolds and special controls.

The presses come in a full line of tonnages in both double and single geared models. *Write*: E. W. Bliss Co., 1375 Raff Rd. S.W., Canton 10, O. *Phone*: 7-3421

NEW PRODUCTS and equipment

Hose Couplings

Open and self-sealing couplings need just a quarter-turn to lock or unlock. They will not uncouple with vibration, pressure or rotation of the hose to which they are attached.



The steel couplings are made in sizes from ½ to 3 in. *Write*: Roylyn Inc., 1706 Standard Ave., Glendale 1, Calif. *Phone*: Chapman 5-1196

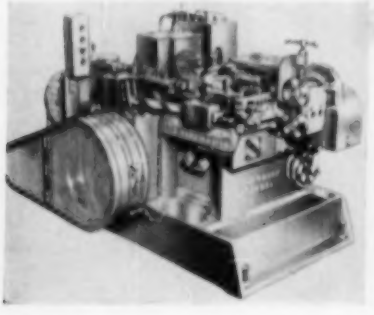
Ladle Lining

Carbon Chem-Brix is a refractory brick for lining mixer, transfer and bessemer steel ladles, hot metal spouts and cupola wells. The bricks are made of fire clay and calcined petroleum coke. *Write*: Illinois Clay Products Co., Barber Bldg., Joliet, Ill. *Phone*: Joliet 5308

Cold Header

The Headmaster is a solid die, double stroke machine that can be equipped with either standard or Phillips type tooling. Its production range is 300 to 450 screw or rivet blanks a minute.

The unit will head rivets up to ⅛ x ¾-in., machine screws up to No. 6 x ¾-in. and sheet metal screws up to No. 8 x ¾-in.

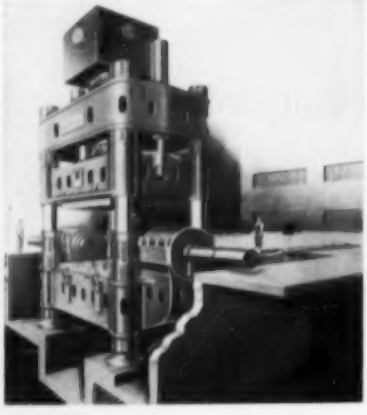


The toggle actuated gate mechanism provides two blows, one long and one short stroke, for each revolution of the flywheel. The gate advances rapidly, then decelerates on contact with the blank, producing a squeezing action rather than an abrupt blow. *Write*: Waterbury Farrel Foundry & Machine Co., Waterbury, Conn. *Phone*: Plaza 6-3621

Forging Press

This press is used for open forging of heavy aluminum billets. The main ram closes and returns at 600 ipm and applies 4000 tons pressure at 300 ipm. Each opposed side ram exerts 1985 tons of pressure at 300 ipm.

The downstroke, column type unit has a main ram stroke of 45 in. Side ram stroke is 24 in. Daylight ranges from 45 to 90 in.



A sliding bolster with a 105-in. stroke is used for placement and removal of dies. *Write*: Lake Erie Engineering Corp., Box 68, Kenmore Station, Buffalo 17, N. Y. *Phone*: Bedford 6900

Point Indicator

The Miracle Point Indicator reduces computing and layout time in joining, shaping, drilling and milling. It is a combination angle-finding, center-loading and leveling device: A mercury balanced level and degree calibrated dial enclosed and mounted on a magnetized V-base.

The instrument reads angles accurately to within 3 minutes of a degree. A center punch runs

through the instrument to aid in marking hole locations. Points can be located at any angle without measuring, computing or scribing. *Write*: Racine Instrument Co., 500 College Ave., Racine, Wis.

Strapping Sealer

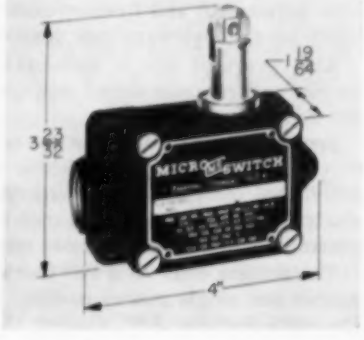
The heavy duty combination strapping sealer and stretcher is hydraulically powered. It has a built-in waste cutoff shear.

Both ¾ and 1¼-in. flat steel strapping can be used in the unit. *Write*: Gerrard Steel Strapping Division, U. S. Steel Corp., 2915 W. 47th St., Chicago 32, Ill. *Phone*: Lafayette 3-1046

Sealed Switch

Inrush currents as high as 75 amperes can be handled by this roller plunger switch. Its actuator is field adjustable through 360 degrees to allow operation from any direction.

The single-pole, double-throw comes with the actuator positioned either to the right or the left. An



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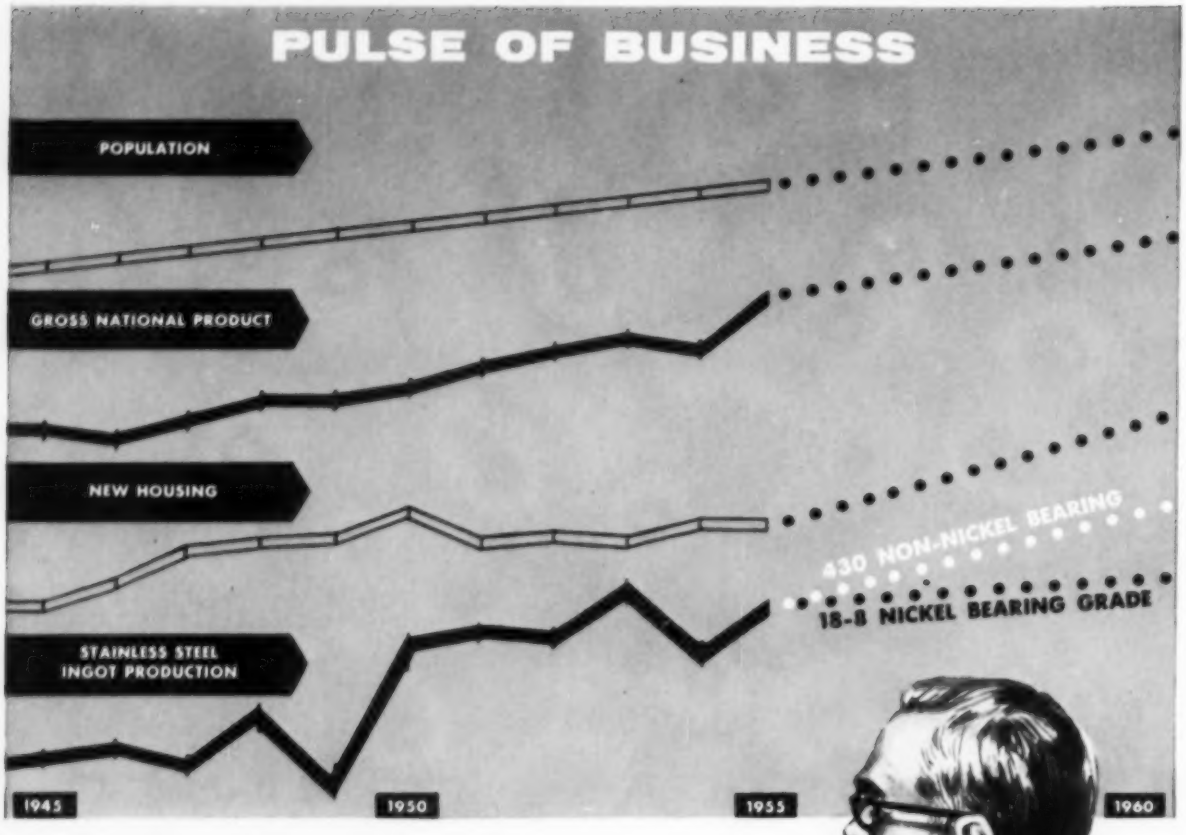

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. . . because Washington Steel Corporation has taken two big steps forward:

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Many designers and fabricators who are currently using Type 302 stainless can, in numerous applications, specify Type 430 straight chromium stainless and take advantage of the 10 cents per pound difference in base price. Some of our customers are already saving more than $200 per ton using our 430 MicroRold stainless steel.

The steel industry estimates that 50% of all stainless sheet applications could satisfactorily employ Type 430, the least expensive of all stainless grades, as an economical and practical material. When properly applied, Type 430 has all the desirable qualities of beauty, corrosion resistance, strength, long life and low maintenance that no other material, *except* stainless, can offer.

We are currently producing our MicroRold Type 430 sheets in thicknesses .005" to .109" with 2B or 2D finishes; and in thicknesses .010" to .109" in No. 3, 4 and 7 finishes.

Type 430 sheets are immediately available for delivery without restriction.
We are supplying the 18-8 grades against rated orders only.

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Send for your copy, "Care and Use of 430 Stainless"

aluminum enclosure protects the unit and provides a means for mounting and conduit connection. *Write*: Micro Switch Division, Minneapolis-Honeywell Regulator Co., Freeport, Ill. *Phone*: Dearborn 2-5244

Mobile Crane

The KE Karry Krane can move any load up to 10,000 lb that can be placed under its boom.

The unit maneuvers quickly and easily in crowded storage areas; it has a short turning radius, rounded rear end and power steering.

Boom lengths of 9, 10 and 12 ft are adjustable to six positions. Hydraulic power for raising and lowering the boom is optional. *Write*: Hyster Co., 2902 N. E. Clackamas St., Portland 8, Oreg. *Phone*: Atlantic 8-5011

Welding Regulators

Series 8000 are inverse-type oxygen and acetylene pressure regulators designed for small metal fabricating shops.

Crowned, clear crystals make the gages easy to read. The regulator body is a machined brass

forging; the spring case is a zinc diecasting.

There are no pressure seals to break when servicing the unit. *Write*: Airco Co. International, division of Air Reduction Co. Inc., 150 E. 42nd St., New York 17, N. Y. *Phone*: Murray Hill 2-6700

LP Gas Conversion Kit

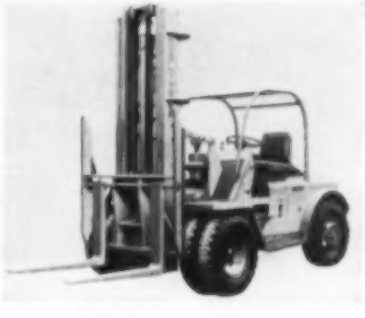
With a preassembled kit, you can convert all makes of industrial lift trucks to LP gas operations in 3 or 4 hours. All lines, fittings and the carburetion assembly are mounted for bolt-on arrangement.

All parts are clearly identified. The kit comes complete with a fuel cylinder bracket, toggle and strap to hold the cylinder in position. *Write*: Industrial Gastruck Inc., 2019 Dempster St., Evanston, Ill.

Fork Lift Trucks

Series W capacities are 12,000, 15,000, 16,000, 18,000, 20,000 and 22,000 lb.

All six wheels are standard 20-in. truck wheels. The rear steering wheels are aligned with the front drive wheels to minimize drag.

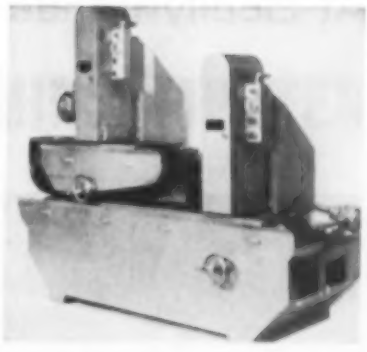


An industrial, overhead valve engine (160 hp, Ford V-8) powers the truck. A Hercules JXD is optional—it's used where continued low engine speeds dictate higher engine torque. *Write*: Department NR. Gerlinger Carrier Co., Dallas, Oreg.

Abrasive Belt Grinder

Both sides of ferrous and nonferrous metals can be surfaced by the two-level, conveyor-type grinder.

Parts are carried under the upper grinding head on an abrasive conveyor belt and automatically turned over in a gravity feed hopper. The lower conveyor belt carries the parts under the second head for grinding the reverse side. Abrasive belt speed is 5500 sfpm. *Write*: Engleberg Huller Co., 831 W. Fayette St., Syracuse 4, N. Y. *Phone*: 4-3195



Coolant Filters

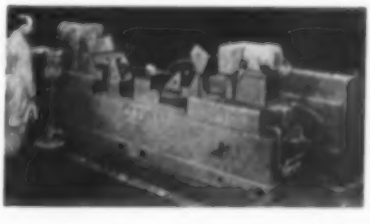
Particles as small as 10 microns are trapped by these accordion pleated, plastic impregnated filters. They remove either ferrous or nonferrous particles, prevent scratching of parts being ground and provide protection for internal pump parts.

Filter elements are easily replaceable and handle either water soluble oils or thread grinding compounds. *Write*: Department G, Purolator Products Inc., Rahway, N. J. *Phone*: Rahway 7-4000

Boring Machine

The Model S Bore-Matic holds close tolerances and concentricity while boring both ends of an automotive differential housing 50 in. long.

Feed-out tools eliminate the tool drag line or spiral normally present in one-way boring operations.



A hydraulic unit mounted at the rear of the machine powers the horizontally opposed slide units which carry tooling to the workpiece. *Write*: Heald Machine Co., Worcester 6, Mass. *Phone*: 5-3191

At Scully-Jones and Co., Chicago:

MACHINING COSTS GREATLY REDUCED

Here's how the Carboloy Machinability Computer showed Scully-Jones and Co., Chicago, how to reduce machining time 46% on a single job. Original operating standard for machining expanding shells called for 244 minutes per part. But by calculating the optimum combination of speeds, feeds, and other data on the Computer, the company saved 48.8 minutes per part. The Computer was used to determine setups for both HSS and carbide tools . . . on turning, facing, drilling, and boring operations.

Partial list of plants now using the Carboloy Machinability Computer:

Allied Products Corp.
Armstrong Cork Company
Beech Aircraft Corp.
Bendix Aviation Corporation
  Utica Division
Bethlehem Steel Company, Inc.
Boeing Airplane Company
Bryant Chucking Grinder Co.
Burroughs Corporation
Caterpillar Tractor Company
Chrysler Corp.
  Airtemp Division
The Cincinnati Shaper Co.
Cone Automatic Machine Co., Inc.
DeLaval Steam Turbine Co.
The DoALL Co.
Fuller Company
General Electric Company
Gisholt Machine Company
Goulds Pumps Inc.
Greenfield Tap and Die Corporation
  Geometric Tool Company Division
Greenlee Bros. & Co.
Houdaille Industries, Inc.
  Buffalo Hydraulics Division
Joy Manufacturing Company
  Claremont Division
Ladish Co.
The Maytag Company
Mergenthaler Linotype Company
Miehle Printing Press & Mfg. Co.
Mueller Brass Co.
The National Acme Company
The New Britain Machine Co.
  New Britain-Gridley Machine Division
Pachmayr Corp.
Porter-Cable Machine Company
Reed Roller Bit Co.
  Cleco Air Tools Division
The R. K. LeBlond Machine Tool Co.
Rockwell Spring & Axle Co.
  Blood Brothers Machine Division
Ryan Aeronautical Company
S. Morgan Smith Co.
Standard Pressed Steel Co.
Sundstrand Aviation
  A Division of Sundstrand Machine Tool Co.
Thompson Products, Inc.
Wagner Electric Corporation
Westfield Metal Products Co., Inc.
The Yale & Towne Manufacturing Co.
  Yale Materials Handling Division

WITH CARBOLOY MACHINABILITY COMPUTER

- **Determined most efficient cutting conditions**
- **Set up new operating standards in seconds**
- **Eliminated wasteful tryout runs, saved stock**
- **Saved 17 hours' machining time on a single job**
- **Provided closer control over machine downtime**

Obtaining maximum production from their machines is now an easier matter for Scully-Jones and Co., Chicago. Machining data are fed into their Carboloy® Machinability Computer . . . and in seconds, optimum speeds, feeds, horsepower ratings, or any of 16 other operating variables are figured for the operator.

On the job at left, for example, the Computer showed how to cut machining time 46% on a 13-piece run . . . saving 17 machining hours, and eliminating wasteful, time-consuming tryout runs.

Benefits extend plant-wide

On other jobs throughout the plant, the Computer established new operating standards, corrected and verified existing ones. When necessary to improve tool life or production rate, the Computer determined new operating conditions in a fraction of the time previously required.

The advantages of the Carboloy Machinability Computer extend far beyond figuring job setups. The Computer simplified inventory problems by predicting the rate of tool wear. It aided grinding rooms in planning work loads, and helped the plant superintendent coordinate production schedules.

The Carboloy Machinability Computer can be used by anyone with machining experience, after a short familiarization period. And, it can be a powerful educational tool by teaching operators how to improve production or reduce downtime through proper variations in operating conditions.

Ask for demonstration

The Machinability Computer is battery-operated, portable, and rugged. It is priced at $495 (f.o.b. factory, Detroit).

For more information on how the Computer can help your plant increase production and reduce manpower costs, mail the coupon below. If you wish, we will gladly arrange a demonstration in your plant.

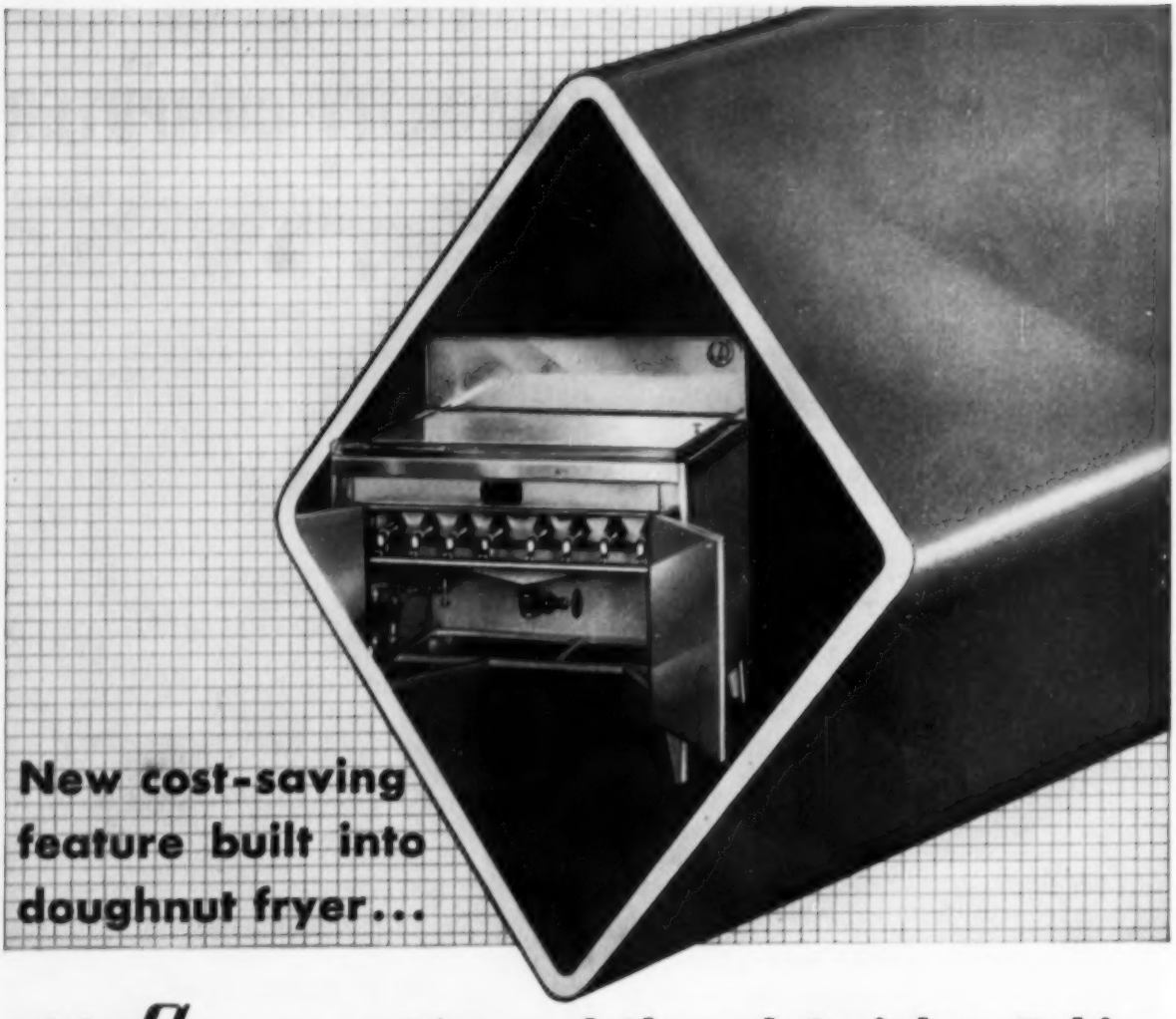
CARBOLOY
DEPARTMENT OF GENERAL ELECTRIC COMPANY
11141 E. 8 Mile Road, Detroit 32, Michigan

☐ Please send more information on the Carboloy Machinability Computer.

☐ Have a representative make an appointment to demonstrate the Computer.

NAME _____
TITLE _____
COMPANY _____
ADDRESS _____
CITY _____ ZONE ____ STATE _____

"Carboloy" is the trademark for products of the Carboloy Department of General Electric Company



with *Carpenter* Diamond-Shaped Stainless Tubing

• A new feature in this volume doughnut fryer is the use of super sanitary heating tubes made from diamond-shaped Carpenter Stainless Tubing. The diamond shape permits faster, more economical heating because of the greater heating surface in contact with the fat. Doughnut crumbs cannot settle on the tubes, making cleaning easier and preserving the fat longer.

This is just one more example of combining the inherent advantages of stainless—high strength-weight ratio, fine appearance, corrosion and abrasion resistance and super sanitation—with the extra benefits of special shapes of Carpenter Stainless Tubing. Why not investigate the possibilities of designing and building the advantages of Carpenter Stainless Tubing shapes into your products. Call your nearest Carpenter Distributor or Branch Office for consultation and information.

MEMBER

The Carpenter Steel Company,
Alloy Tube Division, Union, N. J.

Export Dept.: The Carpenter Steel Co., Port Washington, N. Y.—"CARSTEELCO"

Carpenter

Stainless Tubing & Pipe

NEW literature

Write directly to the company for a copy

Vacuum Pumps

Bulletin 4356, 4 pages, describes pumps that produce vacuums of 24 to 29.9 in. of mercury. Leiman Bros. Inc., 102 Christie St., Newark 5, N. J.

Wire Rope

This 96-page manual covers selection, installation and operating practices. Wire Rope Division, Jones & Laughlin Steel Corp., Muncy, Pa.

Brazing

Case histories of low temperature production brazing are given in bulletin 73. Handy & Harman, 82 Fulton St., New York 38, N. Y.

Refractories

A 4-page bulletin lists a complete line of castable refractory materials. Plibrico Co., 1800 Kingsbury St., Chicago 14, Ill.

Progressive Dies

A 20-page bulletin illustrates case histories of manufacturing progressive dies, tools, jigs, fixtures, gages and special machinery. B. Jahn Mfg. Co., Cherry St., New Britain, Conn.

Air Cleaner

An electronic air cleaner rated in excess of 95 per cent efficiency at 450 fpm is presented in a 6-page bulletin. Trion Inc., 1000 Island Ave., McKees Rocks, Pa.

Carbide Tool

A 4-page bulletin describes properties of a carbide for machining steel. Firth Sterling Inc., 3113 Forbes St., Pittsburgh 30, Pa.

Storage Racks

This 26-page booklet discusses stationary and portable tiering racks. American Metal Products Co., 5959 Linsdale Ave., Detroit, Mich.

Neutralene Gas Producers

Features, dimensions and application data of units which produce purified exothermic gas for protective atmosphere heat treating are given in bulletin GEC-1375, 8 pages. General Electric Co., Schenectady 5, N. Y.

Thermistor Elements

Bulletin EMC-1, 12 pages, has dimensional drawings, descriptions and electrical specifications for precision thermistors, including beads, rods, discs, washers and built-up assemblies. Fenwal Electronics Inc., Mellon St., Framingham, Mass.

Cutting Fluids

Advantages of wax in fluids for cutting and grinding are presented in a 16-page booklet. Industrial Products Department, C. S. Johnson & Son Inc., Racine, Wis.

Markers

Markers for hot or cold surfaces, colors and holders are covered in a 4-page bulletin. Markal Co., 3052 W. Carroll Ave., Chicago 12, Ill.

Motor Reference

Horsepower and dimensions of old and new NEMA ratings are cross referenced in a 4-page bulletin. Marathon Electric Mfg. Co., Wausau, Wis.

Floor Plate

A hot-rolled steel floor plate for industrial cement floors is described in a 4-page folder. Acme Steel Co., 2840 Archer Ave., Chicago 8, Ill.

Machine Mounting

A folder presents 18 case histories of mounts that isolate shock and vibration. Barry Controls Inc., 700 Pleasant St., Watertown, Mass.

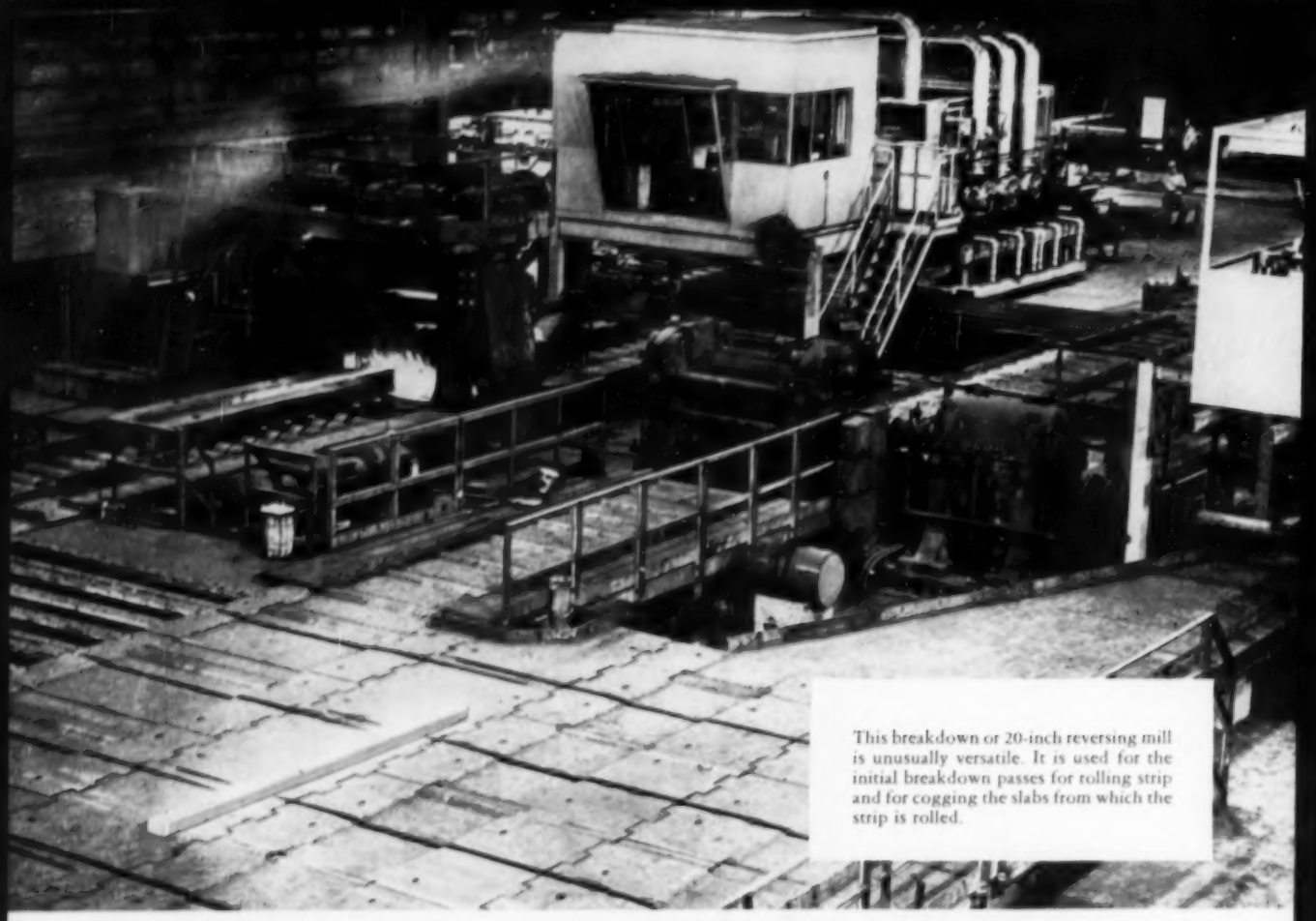
YOU CAN DEPEND ON

SUPERIOR LADLE BRICK

TO ✓ Cut down-time
✓ Lower per ton cost
✓ Increase melting capacity

SERVING THE STEEL INDUSTRY SINCE 1873 ★

The GLOBE BRICK Co.
EAST LIVERPOOL, OHIO



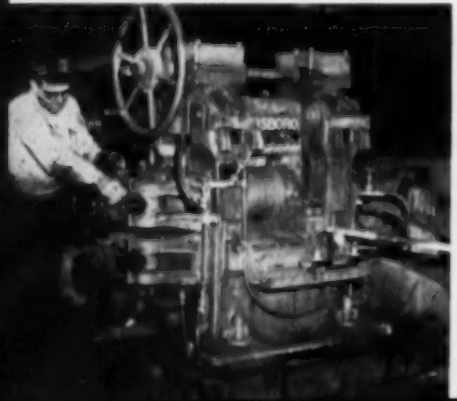
This breakdown or 20-inch reversing mill is unusually versatile. It is used for the initial breakdown passes for rolling strip and for cogging the slabs from which the strip is rolled.

Steel producer picks new **BIRDSBORO** bar, strip and rod mill design to meet "Expansioneering" Demands

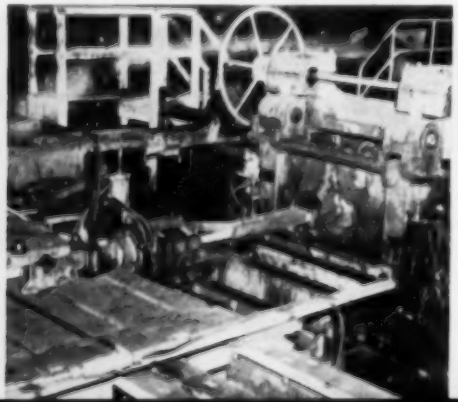
This steel maker needed more than a "standard" mill, since its specialty steel business required unique mill flexibility to render maximum customer service. Special tolerances and highest product quality must be produced quickly, in profitable quantities, with as many automatic operations as possible.

BIRDSBORO was called in on the job because an exacting combination of engineering features was required. Ruggedness, plus the versatility to permit many refinements in the production of steel bar, strip and rod, was a major requirement. Once again, Birdsboro engineers delivered exactly what the producer ordered plus the extra touches that resulted in maximum production efficiency, both in quantity and quality.

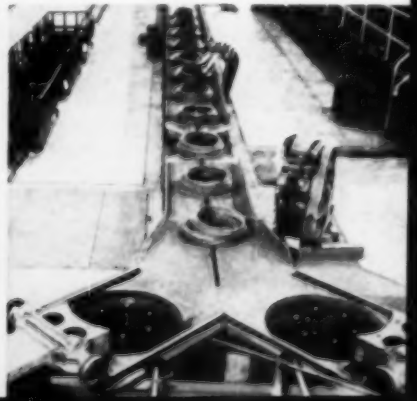
Close size and shape control is gained to micrometer accuracy through end thrust adjustment on this finishing stand.

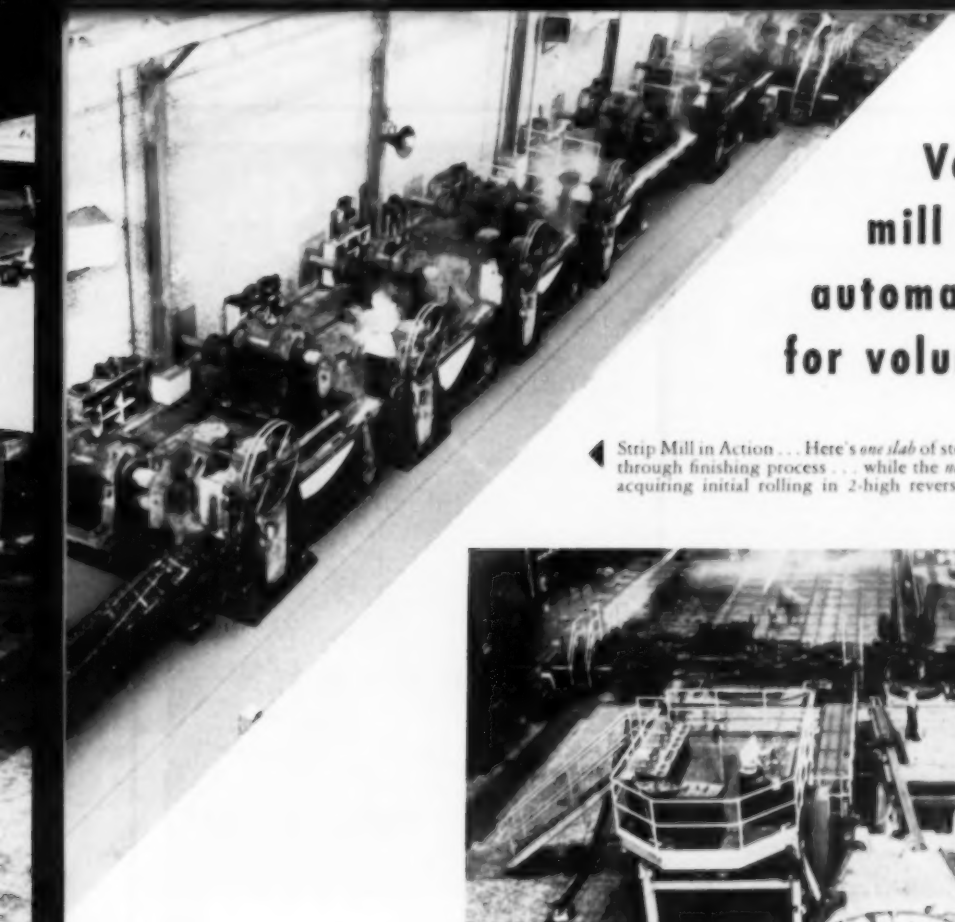


This oval turn-up device on the rod and bar mills eliminates manual stranding common in older types.



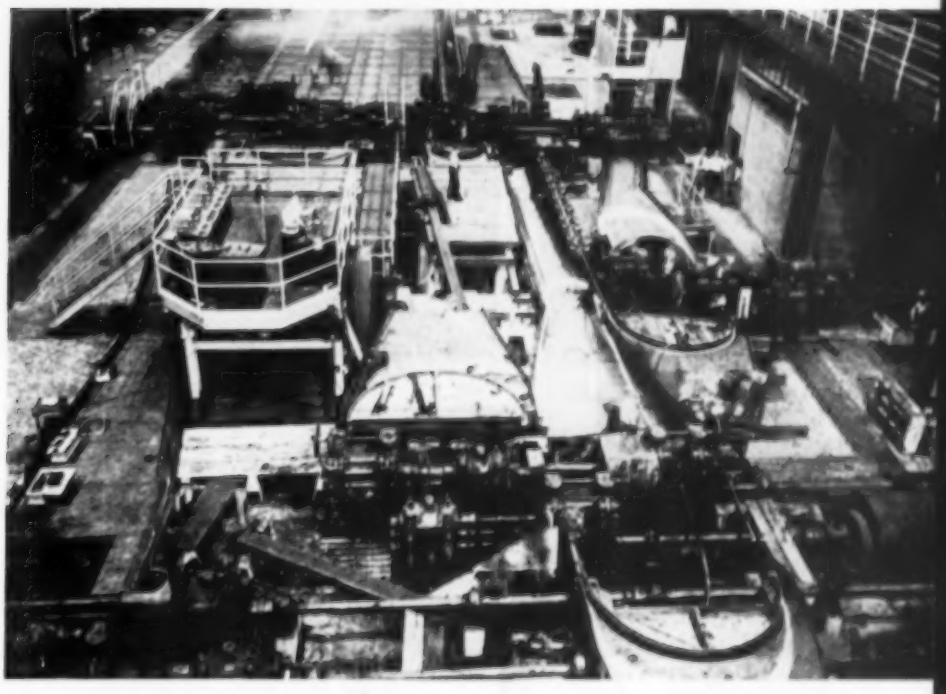
Conveyor table, delivering coils of rods to loading point. Coils are moved separately for individual cooling which helps produce uniform structure in annealing cycles.





Versatile 3-way mill provides speed, automation and accuracy for volume production

◀ Strip Mill in Action . . . Here's *one slab* of steel going through finishing process . . . while the *next slab* is acquiring initial rolling in 2-high reversing mill.



The Continuous looping method is used to roll rods. The rod at upper left is in initial breakdown, while the loops to the right are in the finishing stage. Loops are closely controlled in a small area, aiding in size control and permitting compact design installation.

Not just machines, but ideas, too!

. . . Ideas applied to mill machinery problems that can provide not only a solution, but production advances . . . the advances that will keep your plant profit picture bright for years to come. While your "expansioneering" is still in the planning stage, call in a BIRDSBORO representative. He and the experienced staff that backs him have the design ideas you can profitably apply to your operation.

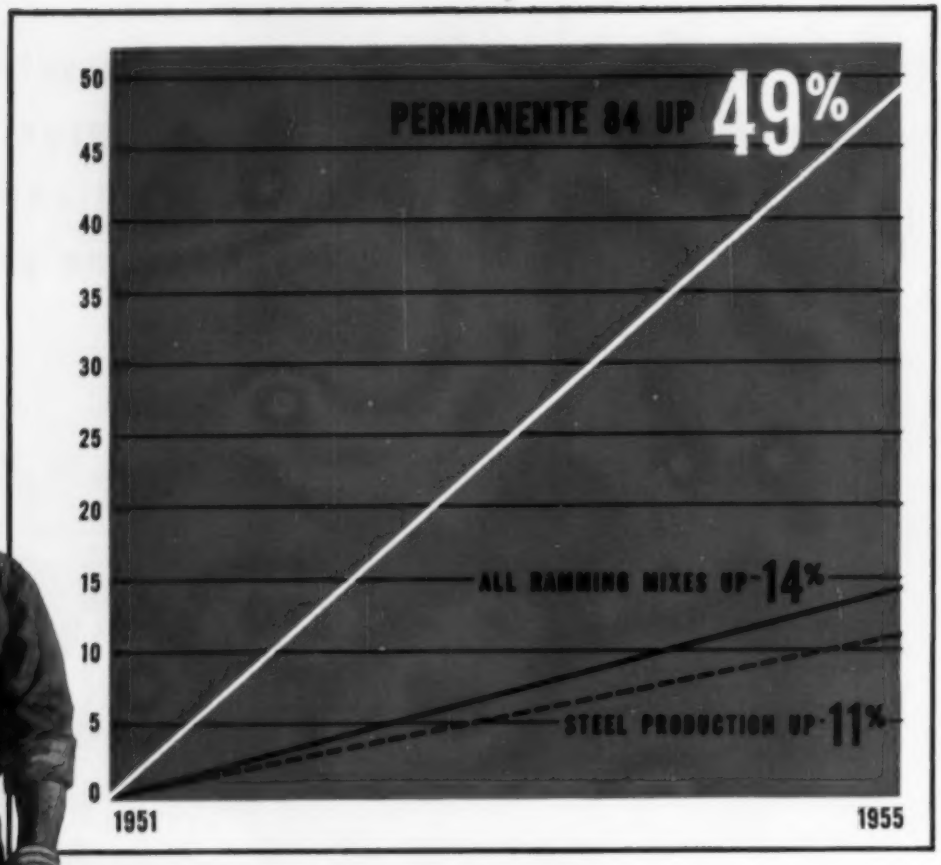
DESIGNERS AND BUILDERS OF:

- STEEL MILL MACHINERY
- HYDRAULIC PRESSES *(Metalworking and Extrusion)*
- CRUSHING MACHINERY
- SPECIAL MACHINERY
- STEEL CASTINGS
- Weldments "CAST-WELD" Design
- ROLLS: Steel, Alloy Iron, Alloy Steel

BIRDSBORO

BIRDSBORO STEEL FOUNDRY & MACHINE CO., Main Offices in Birdsboro, Pa. District Office: Pittsburgh, Pa.

New York Office: **Engineering Supervision Co., 120 West 42nd Street, New York 36, N.Y.**



Why this growing preference for Permanente 84 Ramming Mix!

As you can see from the chart above, sales of all ramming mixes to steel producers increased only 14% during the five year period ending December 31, 1955.

But during this same period, sales of Permanente 84 Ramming Mix increased *a whopping 49%*!

Why is Permanente 84 increasingly preferred by leading steel producers?

Briefly, here are the reasons:

Permanente 84 reduces the cost of maintaining furnace bottoms and banks. Repairs made with Permanente 84 stay put! Down time for hot-repairs is reduced because repairs made with Permanente 84 last longer. Steel production goes up—costs come down. Ideal for hot patching both open hearths and electric furnace banks and bottoms.

Order Permanente 84 now, and get extra steel tonnage at lower cost.

For more information call our nearest Sales Office: Kaiser Chemicals Division, 1924 Broadway, OAKLAND 12, Calif. . . . 3 Gateway Center, PITTSBURGH 22, Pa. . . . 518 Calumet Bldg., 5231 Hohman Avenue, HAMMOND, Indiana.

To obtain free copies of Kaiser Chemicals product literature write Kaiser Aluminum & Chemical Sales Inc., 1924 Broadway, OAKLAND 12, California, Dept. R6212.

KAISER **Kaiser Chemicals**

Pioneers in Modern Basic Refractories

Refractory Brick and Ramming Materials • Castables & Mortars • Magnesite • Periclase • Deadburned Dolomite

Market Outlook

METALWORKING plants can expect to get more money from their steel scrap.

Even though most of the steel industry has been strikebound a month, scrap is higher priced than ever before in July, and it's rising. It's likely to go even higher next winter.

THE REASONS— Here's why: 1. An expected high rate of steel production after the strike will require a large amount of scrap. 2. Until blast furnaces can get into full production, pig iron output will be insufficient and of less than top quality; so scrap will have to fill the gap in steelmaking. 3. Scrap generation is reduced by summer vacations in industrial plants. 4. Scrap may have to substitute next winter for ore that couldn't be brought down the lakes during the steel strike. 5. Collection and shipment of scrap often are hampered by winter weather. 6. Increase in steelmaking capacity (particularly electric furnace) mill expand scrap consumption. 7. Foreign demand for scrap will continue strong. 8. A rise in iron and steel prices customarily pushes scrap prices up, too. (Pig iron, a complement to scrap in steelmaking, is rising $2.50 a gross ton at unstruck plants.)

A MIRROR— Steelmaking scrap's high and rising prices are reflected in STEEL's steelmaking scrap price composite. For the week ended July 25, it was $47.50 a gross ton—a $1 rise over the preceding week and $2 over the year's low of $45.50 in the week ended July 11.

JULY RECORD— Despite the occurrence of the 1956 low price this month, the July average will exceed the previous high July average of $44 recorded in 1951. During July of last year, the average was only $39.67, despite the high production of steel and the quick settlement of steel labor negotiations.

In April of this year, STEEL's price composite on steelmaking scrap hit a record high of $55.33 a gross ton.

The rise in scrap prices now stems from bidding by scrap brokers, demand from the unstruck steel plants, export demand and buying by some strikebound consumers who are storing scrap outside their properties.

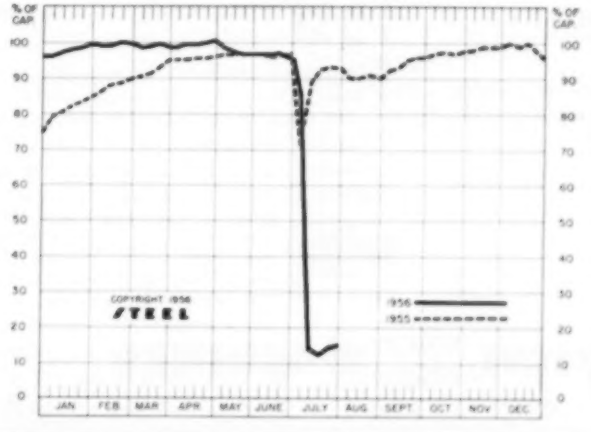
PIG IRON UP— Increases in pig iron prices pushed up STEEL's price composite on basic iron in the week ended July 25 to $60.11 a gross ton (a 15-cent rise); on No. 2 foundry iron to $61.09 (an 18-cent rise); and on malleable to $61.63 (an 18-cent rise).

STEEL's finished steel price composite, which has been on an uptrend this month, marked time at $131.27 a net ton in the week ended July 25.

PRODUCTION— Steel ingot production inched up 1 percentage point in the week ended July 29 to 15.5 per cent of capacity. Just prior to the steelworkers' strike, 95 per cent of the nation's capacity was in operation.

THE PINCH STARTS— Although there were heavy inventories of most forms of steel except plates and structurals, and despite a reduced consumption of steel during the summer vacations, steel supplies are beginning to reflect the strangling effects of the strike. Railroad freight car builders, who use structurals and plates, are reducing operations, and some plan to suspend work this week until steel starts moving again from the mills.

NATIONAL STEELWORKS OPERATIONS



DISTRICT INGOT RATES

(Percentage of Capacity Engaged)

	Week Ended July 29	Change	Same Week 1955	Same Week 1954
Pittsburgh	2	— 0.5	95	60
Chicago	6	0*	94	66.5
Mid-Atlantic	10	— 1	94	57
Youngstown	5	0	98	64
Wheeling	57	+ 3.5	92.5	76
Cleveland	0	0	92	65
Buffalo	0	0	105	56
Birmingham	3.5	0	93.5	75
New England	39	+ 1	82	55
Cincinnati	76.5	+ 7	86	55
St. Louis	95	+ 11	97.5	47.5
Detroit	48.5	+ 5	89.5	54.5
Western	32	+ 2	101	82
National Rate	15.5	+ 1	93	64

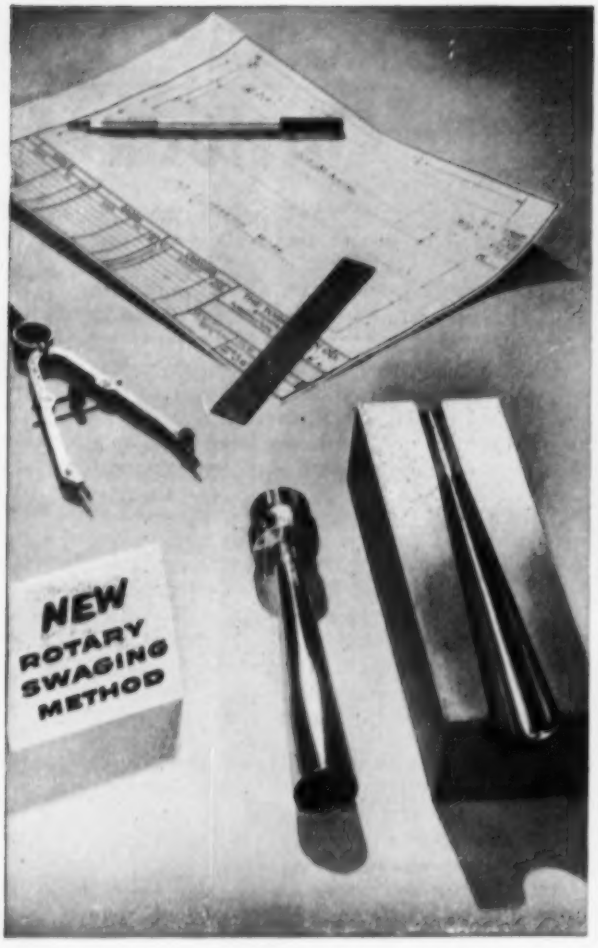
INGOT PRODUCTION‡

	Week Ended July 29	Week Ago	Month Ago	Year Ago
INDEX (1947-1949=100)	24.0†	23.5	137.6	136.3
NET TONS (In thousands)	385†	377	2,114	2,190

*Change from preceding week's revised rate
†Estimated. ‡Amer. Iron & Steel Institute
Weekly capacity (net tons): 2,461,893 in 1956; 2,413,278 in 1955; 2,384,549 in 1954

Metalworking Outlook—p. 43

Technical Outlook—p. 91



ROTARY SWAGING

eliminates waste and scrap

A Torrington Rotary Swaging Machine shapes work instead of cutting metal away, eliminating waste and scrap—cutting processing time as well.

This part was originally turned from a solid brass bar weighing 3 pounds. Cutting cycle was 86 seconds. When swaged from tubing, stock weight was reduced 83%. Swaging of tube and assembling the head took a total of 12 seconds.

If your operations include reducing, tapering, pointing, sizing, bonding, forming inside contours or threads—swaging can save you time, money and material.

Write today for our informative booklet on Torrington Rotary Swaging Machines. Or ask to have a technical representative call to show you how rotary swaging can achieve new savings in your plant.

THE TORRINGTON COMPANY
Swaging Machine Division
150 North Street, Torrington, Conn.

Advantages of Rotary Swaging—

1 **Savings in material**—swaging is chipless—shapes the work instead of cutting metal away.

2 **Savings in labor**—swaging can be done by unskilled labor.

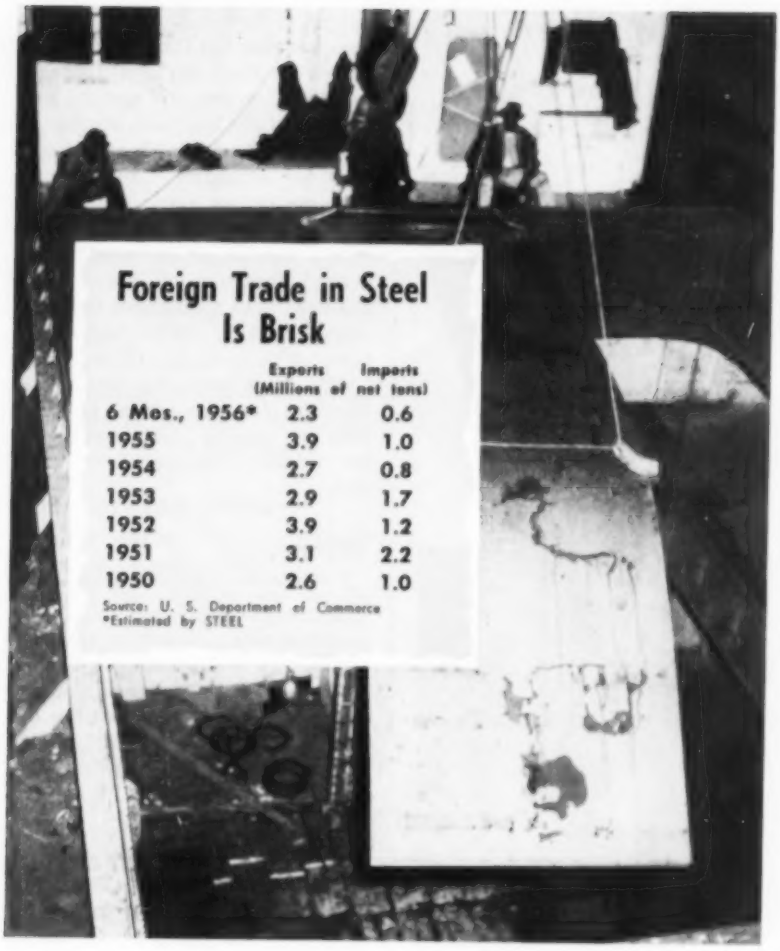
3 **Improved products**—swaging improves grain structure, tensile strength, resiliency and finish. Produces work accurate to ± .001" and better.

Write for new catalog—It describes swaging benefits, covers selection of a swager, and gives specifications of Torrington's new streamlined Rotary Swaging Machines. Ask, too, to see our new motion picture on swaging.

90th ANNIVERSARY 1865-1955

TORRINGTON ROTARY SWAGING MACHINES

Makers of Torrington Needle Bearings



Foreign Trade in Steel Is Brisk

	Exports (Millions of	Imports net tons)
6 Mos., 1956*	2.3	0.6
1955	3.9	1.0
1954	2.7	0.8
1953	2.9	1.7
1952	3.9	1.2
1951	3.1	2.2
1950	2.6	1.0

Source: U. S. Department of Commerce
*Estimated by STEEL

Export-Import: Trends Shift

Steel shipments abroad are at a standstill because of the strike. Result: 1956 tonnage will fall short of 1955's. Import demand is heavy, but delivery is the big problem

"OUR EXPORT boys have been crying for more steel," said one big steelmaker before the strike. The cry has turned into a wail of despair since the mills shut down, spoiling what promised to be the best year for export steel trade since 1952 (see table above).

Export supply and demand have been badly out of balance this year. Both domestic and foreign demands for steel have been exceptionally strong. Similarly, import supply and demand have been almost as unbalanced. And settlement of the strike won't help much.

Halt—One of the largest steel exporters told STEEL that while first-half business was about 15 per cent ahead of last year's pace, 1956 as a whole will fall below the 1955 total, regardless of the length of the strike. While there is some steel going overseas yet from small producers unaffected by the strike, the major movement has been checked.

When movement begins again, there are several trends which will bear watching. Since 1953, shipments abroad of tin mill products have increased about 56 per cent, even though foreign capacity has risen substantially. One midwest producer said before the strike that if there were a lull in the U.S. tin plate market, he could sell his excess to Brazil alone.

Look South, Amigos—Canada is still the No. 1 foreign market, but U.S. producers are wooing fervently our neighbors to the South. Foreign competition has slowed down U.S. shipments in that direction, but one shipper feels that South America is potentially the biggest export growth market. In first quarter of this year, the six leading Latin American markets took about 210,000 tons. Venezuela, Brazil and Argentina got the bulk of that.

To the East, England is not expected to play as important a part in exports in 1956 as in 1955, but demand from other European nations shows no sign of letting up.

Heavy Stuff—Productwise, semifinished steel, sheet and strip are the big items, with the former moving up fast. Last year, this country shipped 721,116 tons of semifinished abroad, up from 94,938 tons in 1954. Almost 1.2 million tons of sheet and strip moved from the docks as the European auto industry hit its peak.

This pattern is changing. Sheet and strip demand has slackened this year, mainly because of the dip in auto production in England. In addition, expansion in producing and finishing facilities abroad is nearly as rapid as in this country. But self-sufficiency in some lines of carbon steels is expected to increase the demand for specialty steels, especially stainless. U.S. exporters expect the over-all level of foreign shipments to benefit from this.

Imports Up—Importers, too, are having their problems. Arrivals during the first half, estimates one New York firm, were about 15 per cent ahead of the corresponding period last year. This company feels sure the 1956 total will surpass the 1 million tons brought in last year. In addition to the industrywide steel strike, one of the

HOW WOULD YOU SOLVE IT?

1. PRODUCTION PROBLEM: To cut unit costs and increase production of grinding off parting lines and other imperfections, and polishing die-cast aluminum vacuum cleaner nozzles prior to plating. Scott and Fetzer Co., makers of famous Kirby vacuum cleaners, were using set-up wheels in a three-grit sequence—#60, #120, #220—to do this operation. Production was 6 finished units per hour.

2. SOLUTION: A 3M Representative suggested that this Cleveland, Ohio manufacturer switch to the 3M Method using Three-M-ite Cloth Belts, Grits #120 and #220. This method increased production 116%—from 6 to 13 finished nozzles per hour—*and* eliminated one grinding operation! Too, the finer polished surface obtained with 3M Belts made for far superior final plating.

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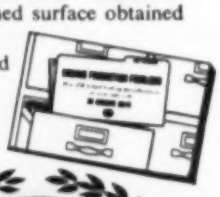

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biggest factors in the increase has been the strike at U.S. Steel Corp.'s Tennessee Coal & Iron Division. Demand for foreign cotton bale ties especially has been strong.

Delivery is the biggest headache for importers. While some items, such as furring channels, are available within a month, most extend to five or six months and beyond. European oil country pipe has even been withdrawn from the world market. With orders increasing as each day of the strike passes, it is becoming almost impossible for importers to take care of regular customers without adding "shoppers" to their lists.

Wire . . .

Wire Prices, Pages 149 & 150

Midcontinent sellers of wire products note a pickup in ordering. Upholstery and automotive needs, which slumped some time ago, are improving. Orders are coming out for remainder of this quarter. Welded wire also is moving at a good clip. So are wire rods.

Sheets, Strip . . .

Sheet & Strip Prices, Pages 148 & 149

Despite some inquiry, sheetmakers generally are accepting little tonnage for fourth quarter shipment. This is understandable because they haven't the slightest idea what their carry-over in the major grades will be going into the closing quarter of the year.

As for specialties, some mills are taking fourth quarter orders, but they are the exception. Action depends on the specialty.

Jones & Laughlin Steel Corp., Pittsburgh, increased prices 5 per cent on its steel drums, effective July 23.

Most sheet users appear to be comfortably supplied for the present. But they are sounding out the mills more actively on odd lots and odd sizes—tonnage that could be moved quickly once the strike is settled. Some producers are unable to accept this business because they can't get their lists out of the mills, and don't know exactly what they have.

Consumption of cold-rolled sheets is relatively slow, reflecting manufacturing suspensions at

many plants for mass vacations. The slower pace of auto production also is a factor.

Generally, the loosening of supplies in the second quarter enabled users to build inventories. At Pittsburgh, some consumers' stocks were estimated at 45 to 60 days when the strike started. Warehouses also were able to accumulate substantial tonnage.

Only a few fabricators have been forced to curtail operations because of short steel supply. These curtailments were caused by shortages of products other than sheets, plates for example.

Reinforcing Bars . . .

Reinforcing Bar Prices, Page 147

Sellers of reinforcing bars are reported beginning to run low on the heavy sizes. They are concentrating more on jobs that fit in with available stocks.

Strong demand for structural steel and the fact that no early relief in supply is in sight are expected to divert an increasing number of building jobs to reinforced concrete construction. This means the mill load will rise.

Two independent bar mills in the Pacific Northwest, which are still operating, have taken considerable business since the general steel strike started. They are said to have been offered tonnage far in excess of their capacity.

Sweet's Steel Co., Williamsport, Pa., advanced reinforcing bars (fabricated to consumers) to 6.65 cents, mill; rail steel bars to 5.25 cents, fence posts to column 175; and light rails to 6.15 cents.

Tubular Goods . . .

Tubular Goods Prices, Page 151

Laclede Steel Co., St. Louis, which has not been closed down by the strike, reports demand for butt-weld pipe is stronger than ever. It is booked through the third quarter and will open fourth quarter books about Aug. 10. Most of this pipe goes to jobbers for plumbing and heating applications.

The interruption of shipments from pipe mills because of the steel strike means that operations will be pressed at capacity for months after peace is restored.

Order books are heavy in most

This is an actual photo of a surface prepared by polishing and etching a cross-section of a forging, to reveal the "grain flow." (x2)

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Second, notice how grain flow lines follow the shape of the part. This improves impact resistance and fatigue strength of the part. In closed-die forging, these flow lines can be positioned, to give maximum properties where they are needed. As a result, forged parts can be lighter, safer, stronger, and frequently less costly.

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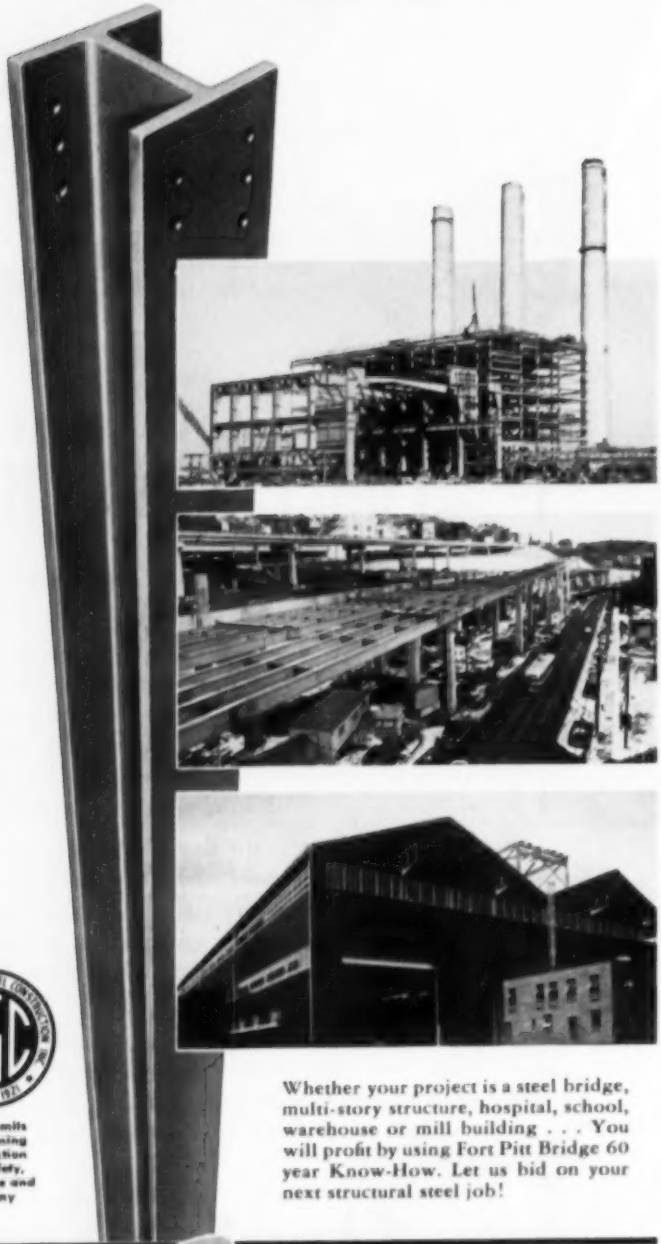

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grades. Even demand for butt-weld pipe had been showing signs of improvement prior to the work stoppage. Oil country demand shows no signs of relaxing. Some oil drilling operations may be curtailed unless volume pipe shipments are resumed soon.

Cast iron pipe sales agencies report slow business during July. This is normal considering the heavy business placed in June prior to the price increase of $6 to $8 per ton (effective July 1).

Structural Shapes . . .

Structural Shape Prices, Page 147

One Pittsburgh area mill is producing small quantities of structurals, but output is insufficient to satisfy local demand. Some gray market offerings are noted in the area.

Industrial construction firms with special priorities can have their constructional steel fabricated, but many projects are being canceled. Steel for a major Pittsburgh project—an east-west freeway—has been fabricated.

Construction for steel mills makes up a large share of total work in some areas. Such construction is almost stopped by the steel strike.

New York state officials say that work on $115 million of state construction will be halted by late August due to the steel strike.

Stainless Steel . . .

Stainless Steel Prices, Page 151

Production of stainless and heat resisting steel ingots totaled 313,334 net tons of ingots in the first quarter of this year, reports the American Iron & Steel Institute. This compares with 311,994 tons in the preceding quarter and with 290,646 tons in the first quarter of 1955.

Sharon Steel Corp., Sharon, Pa., will double capacity to produce stainless and high alloy steel. It will construct a $6 million electric furnace shop at its Roemer Works, Farrell, Pa.

Sharon Steel's principal customers for stainless steel are the automotive industry, producers of household appliances and construction firms. Architectural applications are expected to grow.

Steel Bars . . .

Bar Prices, Page 147

Producers of hot-rolled steel bars, carbon and alloy, continue out of the market for the fourth quarter. This is not unexpected with most mills closed by the strike.

Many plants producing cold-drawn bars are operating and accepting fourth quarter tonnage. Some of these converters have labor contracts expiring July 31. They face the choice of suspending operations or accepting retroactive wage agreements. This may mean higher prices on cold-drawn bars in August.

Generally, consumers' inventories are fair, except for large rounds and flats. Most users are operating from inventories accumulated in the second quarter.

Vacation schedules still affect demand. Hot-rolled barmakers closed by the strike say their regular customers are not experiencing supply difficulties. Salesmen are still booking orders for September shipment.

Plates . . .

Plate Prices, Page 147

Plate orders are reported accumulating in such heavy volume that mills are assured of capacity operations for months after the end of the strike. Two eastern platemakers that were not closed say they can do little more than make a dent in the demand.

Eastern shipyards have been awarded more than a half billion dollars of new work being distributed by the Navy. That going to the Philadelphia Navy Yard includes two 3500-ton guided missile frigates. Work placed with the New York Shipbuilding Corp. includes contracts for the conversion of a light cruiser and an escort carrier.

Smaller plate shops in the Pacific Northwest report a seasonal increase in small tonnage orders. Installation of the Pacific Northwest natural gas system has called for numerous compressors and tanks which have been placed with shops in the area.

The plate tonnage involved in these jobs is not large, but fabricators likely will have difficulty

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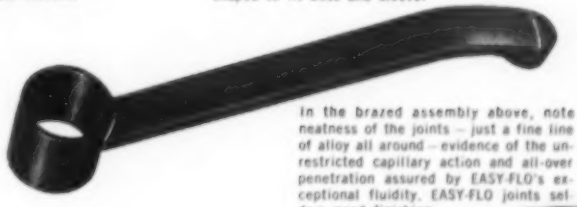
Brass boss and sleeve of the faucet spout are screw machine parts. An EASY-FLO 45 shim and piece of bent wire make the joint at the boss end, and a piece of the alloy wire makes the sleeve joint. Tubing ends are precisely shaped to fit boss and sleeve.



In the brazed assembly above, note neatness of the joints – just a fine line of alloy all around – evidence of the unrestricted capillary action and all-over penetration assured by EASY-FLO's exceptional fluidity. EASY-FLO joints seldom need finishing.

Photos and data courtesy of the Delta Detroit Corp. Detroit, Mich.

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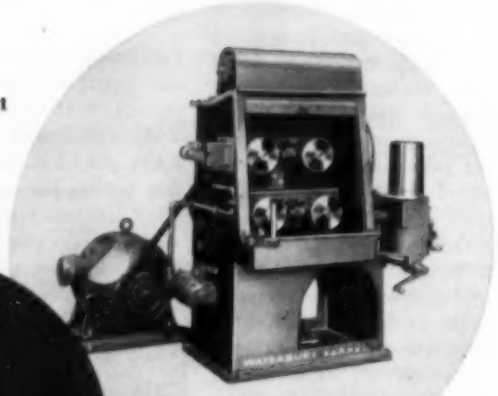
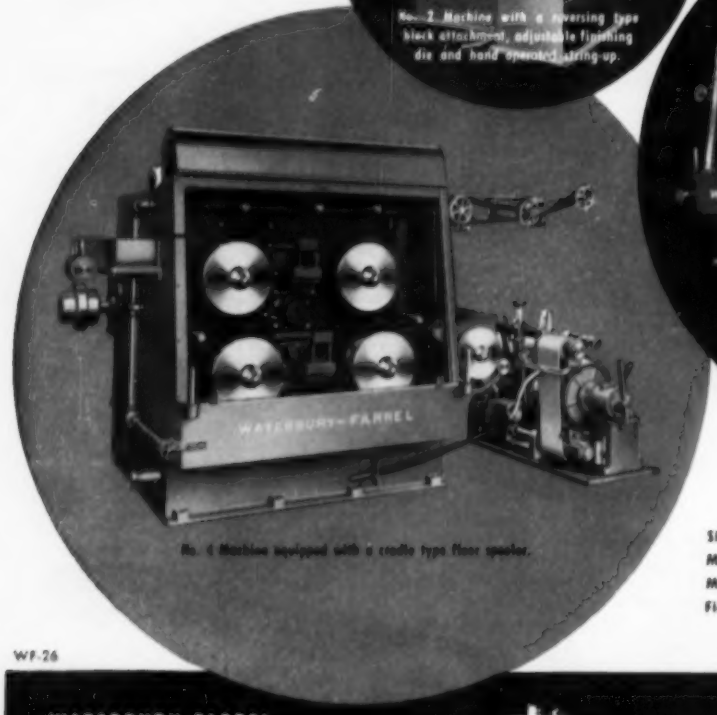


No. 1 Machine with a reversing type block attachment.

No. 2 Machine with a reversing type block attachment, adjustable finishing die and hand operated string-up.

No. 3 Machine with a floor spooler.



No. 4 Machine equipped with a cradle type floor spooler.

SPECIFICATIONS

Size of Machine	No. 1	No. 2	No. 3	No. 4
Max. No. of Dies	16	14	12	13
Max. Starting Size B & S	#14	#8	#4	¼
Finishing Sizes, B & S	#26 to #42	#20 to #34	#14 to #26	#12 to #18

WF-26

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covering their steel needs since plate inventories in the district are declining.

Continental's Capacity To Rise

Continental Steel Corp., Kokomo, Ind., expects its steel ingot production to increase around 7.5 per cent through installation of new ladle and pit cranes. Capacity of the company's five open hearths was 394,000 net tons as of Jan. 1 this year. Installation of the cranes is planned for the first two weeks of August. To minimize loss of ingot production and operations in the finishing departments while the cranes are being installed, the company is scheduling vacations for many of its production people.

Pig Iron . . . .

Pig Iron Prices, Page 152

Interlake Iron Corp., Cleveland, the largest merchant pig iron producer, advanced iron prices $2.50 a ton, effective July 20. This action matches that by a Pittsburgh area and an eastern iron producer. It follows an advance of $4 a ton effected by two southern ironmakers immediately following outbreak of the steel strike.

Alan Wood Steel Co. will enlarge its No. 2 blast furnace at Swedeland, Pa., from a daily capacity of 550 tons to 800 tons. The expansion to be completed by next spring, will permit the company to take care of its foundry iron customers and provide increased tonnage for its own steelworks. The enlargement will raise the company's iron capacity to nearly 600,000 tons annually. Arthur G. McKee Co., Cleveland, has the furnace contract.

Granite City Steel Co., Granite City, Ill., blew in its new blast furnace July 17, the first to be built in the St. Louis area in 30 years. She was christened "Marian" in honor of Mrs. J. N. Marshall, wife of the chairman and chief executive officer of Granite City Steel.

Two producers in the Chicago district have increased prices $2.50 a ton on all grades. Interlake Iron Corp.'s advance was effective as of July 20, while that of Wisconsin Steel Division of International Harvester Co. was effective as of July 23. Operations of these companies are unaffected by the strike.

Ferroalloy Prices

FERROALLOY quotations remain unchanged. The current price schedule was published in full on page 129 of the July 23 issue of STEEL.

Due to the work stoppage at most mills, the movement of merchant iron has slowed down. However, foundries are in a comfortable supply situation. Most of them accumulated fairly large inventories in the second quarter and are operating below normal.

Warehouse . . .

Warehouse Prices, Page 152

With several large warehouses closed by the strike, pressure is on the independents and small distributors. Sheet and tin plate remain the only products in ample supply. Demand for them is light. Bars are tightening in supply. There was little demand for them in early July.

Firms which distribute and fabricate plate and structural shapes are faling behind delivery schedules. Their operations are slowed up by lack of steel. "The only bright spot in structural steel distribution is that all users are resigned to the steel shortage, and they don't clamor for quicker delivery," one warehouseman comments.

July business will be the lowest this year for most distributors. In addition to the shortage of some products, activity has been reduced by mass vacations at many metalworking shops and by sizable pre-strike-accumulated stocks at consuming points. In a sense, the trend has been normal; hot July usually is the dullest month of the year.

Iron Ore . . .

Iron Ore Prices, Page 153

Only 340,977 gross tons of iron ore were hauled down the Great Lakes route in the week ended July 23, reports the Lake Superior Iron Ore Association.

Normally, one week's shipments exceed 3 million tons, but the steel strike idled most of the fleet during July.

Cumulative shipments to July

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23 were 33,450,922 tons, slightly more than 4 million tons under the total on the like date a year ago.

Tin Plate . . .

Tin Plate Prices, Page 149

Metal can shipments totaled 1,739,601 tons in the first five months of this year, compared with 1,555,906 in the like 1955 period, reports the Census Bureau. May shipments of 335,217 tons were down from 480,301 in April.

Movement of fruit and vegetable cans in the first five months amounted to 451,746 tons.

Metallurgical Coke . . .

Metallurgical Coke Prices, Page 153

May coke production totaled 6,733,286 net tons, reports the U.S. Bureau of Mines. This was up 1.5 per cent compared with 6,633,363 tons in April, and compares with 6,421,916 tons in May, 1955.

Of the month's total, 6,467,080 tons were oven coke, up 1.4 per cent from April, and 266,206 tons were beehive, up 5 per cent. In May, 1955, oven coke accounted for 6,286,982 tons, beehive, 134,934 tons.

Stocks of oven coke at the end of May were 1,888,408 tons, equal to 9.1 days' production. This compares with 1,742,772 tons, 8.2 days output, at April's close, and with 2,346,041 tons, 8.9 days production, at end of May, 1955.

Rails, Cars . . .

Track Material Prices, Page 150

Car builders are reducing operations because steel supplies are dwindling. Some plan to suspend entirely Aug. 1.

Car buying is light. Orders increased slightly in June, involving 2858 cars. This compares with 2403 the preceding month, according to the American Railway Car Institute and the Association of American Railroads.

A year ago in June, the railroads launched a heavy buying program with orders for 13,365 freight cars.

June deliveries were 5550 cars, against 6667 in May and 3015 in June last year. Cars on order and undelivered as of July 1 totaled 129,409, against 133,072 on June 1 and 27,102 on July 1, 1955.

Price Indexes and Composites

July 24, 1956	Week Ago	Month Ago	June Avg.	Year Ago
158.5	158.5	158.2	158.2	153.9

AVERAGE PRICES OF STEEL (Bureau of Labor Statistics)

Week Ended July 24

Prices include mill base prices and typical extras and deductions. Units are 100 lb except where otherwise noted in parentheses. For complete description of the following products and extras and deductions applicable to them, write to STEEL.

Rails, Standard No. 1	$4.800	Bars, Reinforcing	5.313
Rails, Light, 40 lb	6.217	Bars, C.F., Carbon	9.000
Tie Plates	5.625	Bars, C.F., Alloy	12.375
Axles, Railway	8.350	Bars, C.F., Stainless, 302 (lb)	0.475
Wheels, Freight Car, 33 in. (per wheel)	52.50	Sheets, H.R., Carbon	5.345
Plates, Carbon	5.200	Sheets, C.R., Carbon	6.214
Structural Shapes	4.967	Sheets, Galvanized	7.770
Bars, Tool Steel, Carbon (lb)	0.460	Sheets, C.R., Stainless, 302 (lb)	0.500
Bars, Tool Steel Alloy, Oil Hardening Die (lb)	0.560	Sheets, Electrical	10.175
Bars, Tool Steel, H. R. Alloy, High Speed W 6.75, Cr 4.5, V 2.1, Mo 5.5, C 0.60 (lb)	1.185	*Strip, C.R., Carbon*	*8.486*
Bars, Tool Steel, H.R., Alloy, High Speed W 18, Cr 4, V 1 (lb)	1.680	*Strip, C.R. Stainless, 403 (lb)*	*0.453*
Bars, H.R., Alloy	9.475	Strip, H.R., Carbon	5.650
Bars, H.R., Stainless, 302 (lb)	0.450	Pipe, Black, Buttweld (100 ft)	16.997
Bars, H.R., Carbon	5.500	Pipe, Galv., Buttweld (100 ft)	21.137
		Pipe, Line (100 ft)	170.038
		Casing, Oil Well, Carbon (100 ft)	165.126
		Casing, Oil Well, Alloy (100 ft)	256.030
Tubes, Boiler (100 ft)	41.530	Black Plate, Canmaking Quality	7.133
Tubing, Mechanical, Carbon (100 ft)	21.360	Wire, Drawn, Carbon	8.575
Tubing, Mechanical Stainless, 304 (100 ft)	178.897	Wire, Drawn, Stainless, 430 (lb)	0.880
Tin plate, Hot-dipped, 1.35 lb	9.333	Bale ties (bundle)	6.537
Tin Plate, Electrolytic, 0.25 lb	8.033	Nails, Wire, 8d Common	8.595
		Wire, Barbed (80-rod spool)	7.847
		Woven Wire Fence (20-rod roll)	18.635

STEEL's FINISHED STEEL PRICE INDEX*

	July 25 1956	Week Ago	Month Ago	Year Ago	5 Yrs. Ago
Index (1935-39 av.=100)	210.45	210.45	210.45	207.63	171.92
Index in cents per lb	5.701	5.701	5.701	5.625	4.657

STEEL's ARITHMETICAL PRICE COMPOSITES

Finished Steel, NT*	$131.27	$131.27	$128.98	$126.64	$106.32
No. 2 Fdry Pig Iron, GT	61.09	60.91†	60.27	58.99	52.54
Basic Pig Iron, GT	60.11	59.96	59.80	58.49	52.16
Malleable Pig Iron, GT	61.63	61.45	61.27	59.77	53.27
Steelmaking Scrap, GT	47.50	46.50	46.00	42.00	44.00

*For explanation of weighted index see STEEL, Sept. 19, 1949, p. 54; of arithmetical price composite, STEEL, Sept. 1, 1952, p. 130.

†Revised

Comparison of Prices

Comparative prices by districts, in cents per pound except as otherwise noted. Delivered prices based on nearest production point.

FINISHED STEEL

	July 25 1956	Week Ago	Month Ago	Year Ago	5 Yrs. Ago
Bars, H.R., Pittsburgh	4.65	4.65	4.65	4.65	3.70
Bars, H.R., Chicago	4.65	4.65	4.65	4.65	3.70
Bars, H.R., deld. Philadelphia	4.93	4.93	4.93	4.90	4.20
Bars, C.F., Pittsburgh	6.25*	6.25*	6.25*	5.90	4.55
Shapes, Std., Pittsburgh	4.60	4.60	4.60	4.60	3.65
Shapes, Std., Chicago	4.60	4.60	4.60	4.60	3.65
Shapes, deld. Philadelphia	5.00	5.00	5.00	4.88	3.91
Plates, Pittsburgh	4.50	4.50	4.50	4.50	3.70
Plates, Chicago	4.50	4.50	4.50	4.50	3.70
Plates, Contesville, Pa.	4.80	4.80	4.80	4.50	4.15
Plates, Sparrows Point, Md.	4.50	4.50	4.50	4.50	3.70
Plates, Claymont, Del.	5.35	5.35	5.35	4.50	4.15
Sheets, H.R., Pittsburgh	4.325	4.325	4.325	4.325	3.60-3.75
Sheets, H.R., Chicago	4.325	4.325	4.325	4.325	3.60
Sheets, C.R., Pittsburgh	5.325	5.325	5.325	5.325	4.35
Sheets, C.R., Chicago	5.325	5.325	5.325	5.325	4.35
Sheets, C.R., Detroit	5.325-5.425	5.325-5.425	5.325-5.425	5.325-5.425	4.55
Sheets, Galv., Pittsburgh	5.85	5.85	5.85	5.85	4.80
Strip, H.R., Pittsburgh	4.325	4.325	4.325	4.325	3.75-4.00
Strip, H.R., Chicago	4.325	4.325	4.325	4.325	3.50
Strip, C.R., Pittsburgh	6.25	6.25	6.25	6.317	4.65-5.35
Strip, C.R., Chicago	6.25-6.35	6.25-6.35	6.25-6.35	6.35-6.45	4.90
Strip, C.R., Detroit	6.35	6.35	6.35	6.35	4.35-5.60
Wire, Basic, Pittsburgh	6.60	6.60	6.60	6.25	4.85-5.10
Nails, Wire, Pittsburgh	7.60	7.60	7.60	7.60	5.90-6.20
Tin plate (1.50 lb), box, Pitts.	$9.85	$9.85	$9.85	$9.05	$6.70

*Including 0.35c for special quality

SEMIFINISHED STEEL

Billets, forging, Pitts. (NT)	$84.50	$84.50	$84.50	$84.50	$66.00
Wire rods, ⅜-⅝" Pitts.	5.375	5.375	5.375	5.025	4.10-4.30

PIG IRON, Gross Ton

Bessemer, Pitts.	$62.25	$62.25	$61.00	$59.50	$53.00
Basic, Valley	60.00	60.00	60.00	58.50	52.00
Basic, deld. Phila.	66.26	66.26	63.76	62.16	56.49
No. 2 Fdry, Neville Island, Pa.	63.00	63.00	60.50	59.00	52.50
No. 2 Fdry, Chicago	60.50-63.00	60.50	60.50	59.00	52.50
No. 2 Fdry, deld. Phila.	66.76	66.76	64.26	62.66	56.99
No. 2 Fdry, Birm.	57.00	57.00	55.00	55.00	48.88
No. 2 Fdry (Birm.) deld. Cin.	62.70	62.70	62.70	62.70	55.33
Malleable, Valley	60.50	60.50	60.50	59.00	52.50
Malleable, Chicago	60.50-63.00	60.50	60.50	59.00	52.50
Ferromanganese, Duquesne	215.00†	215.00†	215.00†	190.00†	188.00*

†74-76% Mn, net ton. *75-82% Mn, gross ton, Etna, Pa.

SCRAP, Gross Ton (Including broker's commission)

No. 1 Heavy Melt, Pittsburgh	$46.50	$44.50	$44.50	$42.00	$45.00
No. 1 Heavy Melt, E. Pa.	50.00	49.00	47.50	43.00	43.50
No. 1 Heavy Melt, Chicago	46.00	46.00	46.00	41.00	43.50
No. 1 Heavy Melt, Valley	49.50	45.50	44.50	41.50	45.00
No. 1 Heavy Melt, Cleve.	45.50	43.50	42.50	39.50	44.00
No. 1 Heavy Melt, Buffalo	44.50	42.50	42.50	34.50	44.00
Rails, Rerolling, Chicago	68.50	67.50	66.50	59.00	52.50
No. 1 Cast, Chicago	45.50	45.50	45.50	45.50	49.00

COKE, Net Ton

Beehive, Furn, Connlsvl.	$14.125	$14.125	$14.125	$13.75	$14.75
Beehive, Fdry, Connlsvl.	16.50	16.50	16.50	16.75	17.50

Typical Bishop Thin Wall Tubing

Whether it be for an hydraulic line in a jet engine . . . a precision part for a scientific instrument . . . wherever there is a need for corrosion or abrasive resistance, or where workability or stress are involved, you can *depend* on BISHOP stainless steel tubing.

Where close tolerances, accurate specifications are to be followed . . . when clean I.D. and O.D. are important factors, look no further for quality, specify BISHOP stainless steel tubing—at comparable prices.

Platinum and Platinum Group Metals
Stainless Steel Tubing
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CAPILLARY, MECHANICAL, HYPODERMIC and AIRCRAFT
Stainless Steel Tubing—seamless and welded and drawn
(.008" to 1.000" O.D.)
(.003" to .083" Wall)

NICKEL AND NICKEL ALLOY TUBING
(up to .625" O.D.)
Flanged, Flared, Milled, Slotted, Swaged, Threaded.

Catalog and Prompt Quotations on request.

J. BISHOP & CO. Platinum Works · Established 1842
Stainless Steel Products Division, Malvern, Pa.

Steel Prices

Mill prices as reported to STEEL, cents per pound except as otherwise noted. *Changes shown in italics.*
Code numbers following mill points indicate producing company. Key to producers, page 148; to footnotes, page 150

SEMIFINISHED

INGOTS, Carbon, Forging (NT)

Munhall,Pa. U5	$65.50

INGOTS, Alloy (NT)

Detroit R7	$69.00
Houston S5	74.00
Midland,Pa. C18	69.00
Munhall,Pa. U5	69.00

BILLETS, BLOOMS & SLABS Carbon, Rerolling (NT)

Aliquippa,Pa. J5	$68.50
Bessemer,Pa. U5	68.50
Bridgeport,Conn. N19	73.50
Buffalo R2	68.50
Clairton,Pa. U5	68.50
Ensley,Ala. T2	68.50
Fairfield,Ala. T2	68.50
Fontana,Calif. K1	82.50
Gary,Ind. U5	68.50
Johnstown,Pa. B2	68.50
Lackawanna,N.Y. B2	68.50
LoneStar,Tex. L6	74.50
Munhall,Pa. U5	68.50
Pittsburgh J5	68.50
S.Chicago,Ill. R2, U5	68.50
S.Duquesne,Pa. U5	68.50
Youngstown R2	68.50

Carbon, Forging (NT)

Aliquippa,Pa. J5	$84.50
Bessemer,Pa. U5	84.50
Bridgeport,Conn. N19	89.50
Buffalo R2	84.50
Canton,O. R2	86.50
Clairton,Pa. U5	84.50
Conshohocken,Pa. A3	97.50
Ensley,Ala. T2	84.50
Fairfield,Ala. T2	84.50
Fontana,Calif. K1	100.50
Gary,Ind. U5	84.50
Geneva,Utah C11	84.50
Houston S5	101.00
Johnstown,Pa. B2	84.50
Lackawanna,N.Y. B2	84.50
LosAngeles B3	94.00
Midland,Pa. C18	84.50
Munhall,Pa. U5	84.50
Pittsburgh J5	84.50
Seattle B3	98.00
S.Chicago R2, U5	84.50
S.Chicago W14	89.50
S.Duquesne,Pa. U5	84.50
S.SanFrancisco B3	94.00

Alloy, Forging (NT)

Bethlehem,Pa. B2	$96.00
Buffalo R2	96.00
Canton,O. R2, T7	96.00
Conshohocken,Pa. A3	111.00
Detroit R7	96.00
Fontana,Calif. K1	127.00
Gary,Ind. U5	96.00
Houston S5	105.00
Ind.Harbor,Ind. Y1	96.00
Johnstown,Pa. B2	96.00
Lackawanna,N.Y. B2	96.00
LosAngeles B3	116.00
Massillon,O. R2	96.00
Midland,Pa. C18	96.00
Munhall,Pa. U5	96.00
S.Chicago R2, U5	96.00
S.Chicago W14	101.00
S.Duquesne,Pa. U5	96.00
Struthers,O. Y1	96.00
Warren,O. C17	106.00

ROUNDS, SEAMLESS TUBE (NT)

Buffalo R2	$103.50
Canton,O. R2	103.50
Cleveland R2	103.50
Gary,Ind. U5	103.50
S.Chicago R2	103.50
S.Chicago W14	108.50
S.Duquesne,Pa. U5	103.50

SKELP

Aliquippa,Pa. J5	4.325
LoneStar,Tex. L6	4.625
Munhall,Pa. U5	4.225
SparrowsPoint,Md. B2	4.225
Warren,O. R2	4.225
Youngstown R2, U5	4.225

WIRE RODS

AlabamaCity,Ala.R2	5.375
Aliquippa,Pa. J5	5.375
Alton,Ill. L1	5.55
Buffalo W12	5.375
Cleveland A7	5.375
Donora,Pa. A7	5.375
Fairfield,Ala. T2	5.375
Houston S5	5.625
IndianaHarbor,Ind. Y1	5.375
Johnstown,Pa. B2	5.375
Joliet,Ill. A7	5.375
KansasCity,Mo. S5	5.625
Kokomo,Ind. C16	5.475
LosAngeles B3	6.175
Minnequa,Colo. C10	5.625
Monessen,Pa. P7	5.375
N.Tonawanda,N.Y. B11	5.375
Pittsburg Calif. C11	6.025
Portsmouth,O. P12	5.725
Roebling,N.J. R5	5.475
S.Chicago,Ill. R2	5.375
SparrowsPoint,Md. B2	5.475
Sterling,Ill.(1) N15	5.375
Sterling,Ill. N15	5.475
Struthers,O. Y1	5.375
Worcester,Mass. A7	5.675

STRUCTURALS

Carbon Steel Std. Shapes

Ala.City,Ala. R2	4.60
Aliquippa,Pa. J5	4.60
Bessemer,Ala. T2	4.60
Bethlehem,Pa. B2	4.65
Birmingham C15	5.10
Clairton,Pa. U5	4.60
Fairfield,Ala. T2	4.60
Fontana,Calif. K1	5.75
Gary,Ind. U5	4.60
Geneva,Utah C11	4.60
Houston S5	4.70
Ind.Harbor,Ind. I-2	4.60
Johnstown,Pa. B2	4.65
KansasCity,Mo. S5	4.70
Lackawanna, N.Y. B2	4.65
LosAngeles B3	5.39
Minnequa,Colo. C10	4.90
Munhall,Pa. U5	4.60
Niles,Calif. P1	5.75
Phoenixville,Pa. P4	5.15
Portland,Oreg. O4	5.35
Seattle B3	5.35
S.Chicago W14	4.85
S.Chicago,Ill. U5	4.60
S.SanFrancisco B3	5.25
Torrance,Calif. C11	5.30
Weirton,W.Va. W6	4.60

Wide Flange

Bethlehem,Pa. B2	4.65
Clairton,Pa. U5	4.63
Fontana,Calif. K1	5.90
Lackawanna,N.Y. B2	4.65
Munhall,Pa. U5	4.60
Phoenixville,Pa. P4	5.15
S.Chicago,Ill. U5	4.60

Alloy Std. Shapes

Clairton,Pa. U5	5.65
Fontana,Calif. K1	7.85
Gary,Ind. U5	5.65
Houston S5	5.75
Munhall,Pa. U5	5.65
S.Chicago,Ill. U5	5.65

H.S., L.A. Std. Staples

Aliquippa,Pa. J5	6.75
Bessemer,Ala. T2	6.75
Bethlehem,Pa. B2	6.80
Clairton,Pa. U5	6.75
Fairfield,Ala. T2	6.75
Fontana,Calif. K1	7.90
Gary,Ind. U5	6.75
Geneva,Utah C11	6.75
Houston S5	6.85
Ind.Harbor,Ind. I-2, Y1	6.75
Johnstown,Pa. B2	6.80
KansasCity,Mo. S5	6.85
Lackawanna,N.Y. B2	6.80
LosAngeles B3	7.45
Munhall,Pa. U5	6.75
Seattle B3	7.50
S. Chicago,Ill. U5	6.75
S.Chicago W14	7.00
S.SanFrancisco B3	7.40
Struthers, O. Y1	6.75

H.S., L.A. Wide Flange

Bethlehem,Pa. B2	6.80
Lackawanna,N.Y. B2	6.80
Munhall,Pa. U5	6.75
S.Chicago,Ill. U5	6.75

PILING

BEARING PILES

Bethlehem,Pa. B2	4.65
Lackawanna,N.Y. B2	4.65
Munhall,Pa. U5	4.60
S.Chicago,Ill. U5	4.60

STEEL SHEET PILING

Ind.Harbor,Ind. I-2	5.45
Lackawanna,N.Y. B2	5.45
Munhall,Pa. U5	5.45
S.Chicago,Ill. U5	5.45

PLATES

PLATES, Carbon Steel

Ala.City,Ala. R2	4.50
Aliquippa,Pa. J5	4.50
Ashland,Ky. (15) A10	4.50
Bessemer,Ala. T2	4.50
Bridgeport,Conn. N19	4.75
Buffalo R2	4.50
Clairton,Pa. U5	4.50
Claymont,Del. C22	5.35
Cleveland J5, R2	4.60
Coatesville,Pa. L7	4.80
Conshohocken,Pa. A3	4.95
Detroit M1	4.60
Ecorse,Mich. G5	4.60
Fairfield,Ala. T2	4.50
Fontana,Calif.(30) K1	5.65
Gary,Ind. U5	4.50
Geneva,Utah C11	4.50
GraniteCity,Ill. G4	5.15
Harrisburg,Pa. P4	5.10
Houston S5	4.60
Ind.Harbor,Ind. I-2, Y1	4.50
Johnstown,Pa. B2	4.50
Lackawanna,N.Y. B2	4.50
LoneStar,Tex. L6	4.85
Mansfield,O. E6	4.50
Minnequa,Colo. C10	5.35
Munhall,Pa. U5	4.50
Newport,Ky. N9	4.90
Pittsburgh J5	4.50
Riverdale,Ill. A1	4.90
Seattle B3	5.40
Sharon,Pa. S3	4.50
S.Chicago R2, U5	4.50
S.Chicago W14	4.75
SparrowsPoint,Md. B2	4.50
Steubenville,O. W10	4.50
Warren,O. R2	4.50
Weirton,W.Va. W6	4.50
Youngstown R2, U5, Y1	4.50

PLATES, Carbon Abras. Resist.

Claymont,Del. C22	6.20
Fontana,Calif. K1	6.80
Geneva,Utah C11	5.65
Johnstown,Pa. B2	5.65
SparrowsPoint,Md. B2	5.65

PLATES, Wrought Iron

Economy,Pa. B14	11.128

PLATES, High-Strength Low-Alloy

Aliquippa,Pa. J5	6.725
Bessemer,Ala. T2	6.725
Clairton,Pa. U5	6.725
Cleveland J5, R2	6.725
Claymont,Del. C22	6.725
Coatesville,Pa. L7	7.025
Conshohocken,Pa. A3	7.175
Ecorse,Mich. G5	6.825
Fairfield,Ala. T2	6.725
Fontana,Calif.(30) K1	7.875
Gary,Ind. U5	6.725
Geneva,Utah C11	6.725
Houston S5	6.825
Ind.Harbor,Ind. I-2, Y1	6.725
Johnstown,Pa. B2	6.725
Munhall,Pa. U5	6.725
Pittsburgh J5	6.725
Seattle B3	7.625
Sharon,Pa. S3	6.725
S.Chicago,Ill. U5	6.725
S.Chicago W14	6.975
SparrowsPoint,Md. B2	6.725
Warren,O. R2	6.725
Youngstown U5, Y1	6.725

PLATES, Alloy

Bridgeport,Conn. N19	6.55
Claymont,Del. C22	6.30
Coatesville,Pa. L7	6.30
Fontana,Calif.(30) K1	7.70
Gary,Ind. U5	6.30
Houston S5	6.40
Ind.Harbor,Ind. Y1	6.30
Johnstown,Pa. B2	6.30
Munhall,Pa. U5	6.30
Newport,Ky. N9	7.00
Seattle B3	7.20
Sharon,Pa. S3	6.30
S.Chicago,Ill. U5	6.30
S.Chicago W14	6.55
SparrowsPoint,Md. B2	6.30
Youngstown Y1	6.30

FLOOR PLATES

Cleveland J5	5.575
Conshohocken,Pa. A3	6.025
Harrisburg,Pa. P4	5.575
Ind.Harbor,Ind. I-2	5.575
Munhall,Pa. U5	5.575
S.Chicago,Ill. U5	5.575

PLATES, Ingot Iron

Ashland c.l. (15) A10	4.75
Ashland l.c.l. (15) A10	5.25
Cleveland c.l. R2	5.10
Warren,O. c.l. R2	5.10

BARS

BARS, Hot-Rolled Carbon (Merchant Quality)

Ala.City,Ala.(9) R2	4.65
Aliquippa,Pa.(9) J5	4.65
Alton,Ill. L1	4.85
Atlanta(9) A11	5.15
Bessemer,Ala.(9) T2	4.65
Birmingham C15	5.15
Bridgeport,Conn. N19	4.80
Buffalo(9) R2	4.65
Canton,O.(9) R2	4.75
Clairton,Pa.(9) U5	4.65
Cleveland(9) R2	4.65
Ecorse,Mich.(9) G5	4.75
Emeryville,Calif. J7	5.40
Fairfield,Ala.(9) T2	4.65
Fairless,Pa.(9) U5	4.80
Fontana,Calif.(9) K1	5.80
Gary,Ind.(9) U5	4.65
Houston(9) S5	4.90
Ind.Harbor,Ind.(9) I-2	4.65
Ind.Harbor,Ind. Y1	4.65
Johnstown,Pa.(9) B2	4.65
Joliet,Ill. P22	5.15
KansasCity,Mo.(9) S5	4.90
Lackawanna(9) B2	4.65
LosAngeles(9) B3	5.35
Massillon,O. (9) R2	4.75
Midland,Pa.(9) C18	4.65
Milton,Pa. M18	5.25
Minnequa,Colo. C10	5.10
Niles,Calif. P1	5.85
N.T'wanda,N.Y.(9) B11	4.65
Pittsburg,Calif.(9) C11	5.35
Pittsburgh(9) J5	4.65
Portland,Oreg. O4	5.40
Seattle B3, N14	5.40
S.Chicago W14	4.90
S.Chicago,Ill.(9) R2, U5	4.65
S.Duquesne,Pa.(9) U5	4.65
S.SanFran.,Calif.(9) B3	5.40
Sterling,Ill.(1) N15	4.65
Sterling,Ill. N15	4.75
Struthers,O. Y1	4.65
Torrance,Calif.(9) C11	5.35
Warren,O.(9) R2	4.65
Weirton,W.Va. (9) W6	4.65
Youngstown(9) R2, U5	4.65

BARS, H.R. Loaded Alloy

Warren,O. C17	7.075

BARS, Hot-Rolled Alloy

Bethlehem,Pa. B2	5.575
Bridgeport,Conn. N19	5.725
Buffalo R2	5.575
Canton,O. R2, T7	5.575
Clairton,Pa. U5	5.575
Detroit R7	5.575
Ecorse,Mich. G5	5.675
Fairless,Pa. U5	5.725
Fontana,Calif. K1	7.175
Gary,Ind. U5	5.575
Houston S5	5.825
Ind.Harbor,Ind. I-2, Y1	5.575
Johnstown,Pa. B2	5.575
KansasCity,Mo. S5	5.825
Lackawanna,N.Y. B2	5.575
LosAngeles B3	6.625
Massillon,O. R2	5.575
Midland,Pa. C18	5.575
S.Chicago R2, U5	5.575
S.Chicago W14	5.825
S.Duquesne,Pa. U5	5.575
Struthers,O. Y1	5.575
Warren,O. C17	6.075
Youngstown U5	5.575

BARS & SMALL SHAPES, H.R. High-Strength Low-Alloy

Aliquippa,Pa. J5	6.80
Bessemer, Ala. T2	6.80
Bethlehem,Pa. B2	6.80
Clairton,Pa. U5	6.80
Cleveland R2	6.80
Ecorse,Mich. G5	6.90
Fairfield,Ala. T2	6.80
Fontana,Calif. K1	7.95
Gary,Ind. U5	6.80
Houston S5	7.05
Ind.Harb.,Ind. I-2, Y1	6.80
Johnstown,Pa. B2	6.80
KansasCity,Mo. S5	7.05
Lackawanna,N.Y. B2	6.80
LosAngeles B3	7.50
Pittsburgh J5	6.80
Seattle B3	7.55
S.Chicago W14	7.05
S. Duquesne,Pa. U5	6.80
S.SanFrancisco B3	7.55
Struthers,O. Y1	6.80
Warren,O. R2	6.80
Youngstown U5	6.80

BAR SIZE ANGLES; H.R. Carbon

Bethlehem,Pa.(9) B2	4.80
Lackawanna(9) B2	4.65

BAR SIZE ANGLES; S. Shapes

Aliquippa,Pa. J5	4.65
Atlanta A11	5.15
Fontana,Calif. K1	5.35
Joliet,Ill. P22	5.10
Niles,Calif. P1	5.85
Pittsburgh J5	4.65
Portland,Oreg. O4	5.40
SanFrancisco S7	5.05

BAR SHAPES, Hot-Rolled Alloy

Clairton,Pa. U5	5.65
Gary,Ind. U5	5.65
Houston S5	5.90
KansasCity,Mo. S5	5.90
Youngstown U5	5.65

BARS, C.F. Loaded Alloy

Ambridge,Pa. W18	8.325
Camden,N.J. P13	8.35
Chicago W18	8.325
Cleveland C20	8.325
Monaca,Pa. S17	8.325
Newark,N.J. W18	8.50
SpringCity,Pa. K3	8.30
Warren,O. C17	9.075

BARS, Cold-Finished Carbon

Ambridge,Pa. W18	6.25
BeaverFalls,Pa. M12,R2	6.25
Buffalo B5	6.30
Camden,N.J. P13	6.85
Carnegie,Pa. C12	6.25
Chicago W18	6.25
Cleveland A7, C20	6.25
Detroit B5, P17	6.45
Detroit R7	6.25
Donora,Pa. A7	6.25
Elyria,O. W8	6.25
FranklinPark,Ill. N5	6.25
Gary,Ind. R2	6.25
GreenBay,Wis. F7	6.25
Hammond,Ind. L2, M13	6.25
Hartford,Conn. R2	6.75
Harvey,Ill. B5	6.25
LosAngeles(49) S30	7.70
LosAngeles R2	7.70
Mansfield,Mass. B5	6.80
Massillon,O. R2, R8	6.25
Midland,Pa. C18	6.25
Monaca,Pa. S17	6.25
Newark,N.J. W18	6.70
NewCastle,Pa.(17) B4	6.25
Pittsburgh J5	6.25
Plymouth,Mich. P5	6.50
Putnam,Conn. W18	6.80
Readville,Mass. C14	6.80
S.Chicago,Ill. W14	6.50
SpringCity,Pa. K3	6.70
Struthers,O. Y1	6.25
Waukegan,Ill. A7	6.25
Worcester,Mass. W19	6.70
Youngstown F3, Y1	6.25

BARS, Cold-Finished Carbon (Turned and Ground)

Cumberland,Md.(5) C19	5.15

BARS, Cold-Finished Alloy

Ambridge,Pa. W18	7.425
BeaverFalls,Pa. M12,R2	7.425
Bethlehem,Pa. B2	7.425
Buffalo B5	7.425
Camden,N.J. P13	7.75
Canton,O. T7	7.425
Carnegie,Pa. C12	7.425
Chicago W18	7.425
Cleveland A7, C20	7.425
Detroit R7	7.425
Detroit B5, P17	7.625
Donora,Pa. A7	7.425
Elyria,O. W8	7.425
Gary,Ind. R2	7.425
GreenBay,Wis. F7	7.425
Hammond,Ind. L2, M13	7.425
Hartford,Conn. R2	7.725
Harvey,Ill. B5	7.425
Lackawanna,N.Y. B2	7.425
LosAngeles S30	9.10
Manafield,Mass. B5	7.725
Massillon,O. R2, R8	7.425
Midland,Pa. C18	7.425
Monaca,Pa. S17	7.425
Newark,N.J. W18	7.60
Plymouth,Mich. P5	7.625
S.Chicago W14	7.675
SpringCity,Pa. K3	7.60
Struthers,O. Y1	7.425
Warren,O. C17	7.925
Waukegan,Ill. A7	7.425
Worcester,Mass. A7	7.725
Youngstown F3, Y1	7.425

BARS, Reinforcing (To Fabricators)

Ala.City,Ala. R2	4.65
Atlanta A11	5.15
Birmingham C15	5.15
Buffalo R2	4.65
Cleveland R2	4.65
Ecorse,Mich. G5	4.75
Emeryville,Calif. J7	5.40
Fairfield,Ala. T2	4.65
Fairless,Pa. U5	4.80
Fontana,Calif. K1	5.80
Ft.Worth,Tex.(42) T4	5.10
Gary,Ind. U5	4.65
Houston S5	4.90

Ind.Harbor,Ind. I-2, Y1..4.65
Johnstown,Pa. B2 .....4.65
Joliet,Ill. P22 .....5.15
KansasCity,Mo. S5 ....4.90
Lackawanna,N.Y. B2 ..4.65
LosAngeles S3 .....5.35
Milton,Pa. M18 .....5.25
Minnequa,Colo. C10 ....5.10
Niles,Calif. P1 .....5.85
Pittsburg,Calif. C11 ....5.35
Pittsburgh J5 .....4.65
Portland,Oreg. O4 ....5.40
SandSprings,Okla. S5 ..5.15
Seattle B3, N14 .....5.40
S.Chicago R2 .....4.65
S.Duquesne,Pa. U5 ....4.65
S.SanFrancisco B3 ....5.40
SparrowsPoint,Md. B2 ..4.65
Sterling,Ill.(1) N15 ....4.65
Sterling,Ill. N15 .....4.75
Struthers,O. Y1 .....4.65
Torrance,Calif. C11 ....5.35
Youngstown R2, U5 ....4.65

BARS, Reinforcing
(Fabricated; to Consumers)

Johnstown,Pa. ½-1" B2..6.15
KansasCity,Kans. S5 ...6.45
Lackawanna,N.Y. B2 ..6.17
Marion,O. P11 .....6.15
Pittsburgh U8 .....6.17
Seattle B3, N14 .....6.60
SparrowsPt. ½-1" B2 ..6.15
Williamsport,Pa. S19 ....6.65

RAIL STEEL BARS

ChicagoHts.(3) C2, I-2..4.65
ChicagoHts.(4) C2, I-2..4.65
Ft.Worth,Tex.(26) T4...5.10
Franklin,Pa.(3) F5 ....4.65
Franklin,Pa.(4) F5 ....4.65
JerseyShore,Pa.(4) J8 ....5.00
Marion,O.(3) P11 .....4.65
Moline,Ill.(3) R2 .....4.80
Tonawanda(3) B12 ....5.15
Tonawanda(4) B12 ....5.15
Williamsport,Pa.(4) S19 .5.65

BARS, Wrought Iron

Economy,Pa. (S.R.)B14 12.305
Economy,Pa.(D.R.)B1415.301
Economy(Staybolt)B14 15.676
McK.Rks.(S.R.) L5 ...11.50
McK.Rks.(D.R.) L5 ...16.00
McK.Rks.(Staybolt) L5..17.00

SHEETS

SHEETS, Hot-Rolled Steel
(18 Gage and Heavier)

Ala.City,Ala. R2 .....4.325
Allenport,Pa. P7 .....4.325
Ashland,Ky.(8) A10 ...4.325
Cleveland J5, R2 .....4.325
Conshohocken,Pa. A3 ..4.775
Detroit(8) M1 .....4.325
Dravosburg,Pa. U5 ....4.325
Ecorse,Mich. G5 .....4.325
Fairfield,Ala. T2 .....4.325
Fairless,Pa. U5 .....4.325
Fontana,Calif. K1 ....5.575
Gary,Ind. U5 .....4.325
Geneva,Utah C11 .....4.425
GraniteCity,Ill. G4 ....4.95
Ind.Harbor,Ind. I-2, Y1..4.325
Lackawanna,N.Y. B2 ..4.325
Mansfield, O. E6 (37) ..4.325
Munhall,Pa. U5 .....4.325
Newport,Ky.(8) N9 ....4.725
Niles,O. M21 .....4.325
Pittsburg,Calif. C11 ..5.025
Pittsburgh J5 .....4.325
Portsmouth,O. P12 ....4.725
Riverdale,Ill. A1 .....4.725
Sharon,Pa. S3 .....4.325
S.Chicago,Ill. W14 ....4.575
SparrowsPoint,Md. B2..4.325
Steubenville,O. W10 ...4.325
Warren,O. R2 .....4.325
Weirton,W.Va. W6 ....4.325
Youngstown U5, Y1 ....4.325

SHEETS, H.R., (19 Ga. & Lighter)

Ala.City,Ala. R2 .....5.625
Niles,O. M21 .....5.325

SHEETS, H.R. Alloy

Dravosburg,Pa. U5 ....7.20
Gary,Ind. U5 .....7.20
Ind.Harbor,Ind. Y1 ....7.20
Newport,Ky. N9 .....7.90
Youngstown Y1, U5 ....7.20

SHEETS, H.R. (14 Ga. & Heavier)
High-Strength Low-Alloy

Cleveland J5, R2 .....6.375
Conshohocken,Pa. A3..6.825
Dravosburg,Pa. U5 ....6.375
Ecorse,Mich. G5 .....6.475
Fairfield,Ala. T2 .....6.375
Fairless,Pa. U5 .....6.425
Fontana,Calif. K1 ....7.625
Gary,Ind. U5 .....6.375
Ind.Harbor,Ind. I-2, Y1 6.375
Lackawanna(35) B2 ..6.375
Munhall,Pa. U5 .....6.375
Pittsburgh J5 .....6.375
Sharon,Pa. S3 .....6.375
S.Chicago,Ill U5 .....6.375
SparrowsPoint(36) B2..6.375
Warren,O. R2 .....6.375
Youngstown U5, Y1 ...6.375

SHEETS, Hot-Rolled Ingot Iron
(18 Gage and Heavier)

Ashland,Ky.(8) A10 ...4.575
Ind.Harbor,Ind. I-2 ...4.575

SHEETS, Cold-Rolled Steel
(Commercial Quality)

Allenport,Pa. P7 .....5.325
Cleveland J5, R2 .....5.325
Conshohocken,Pa. A3 ..5.775
Dravosburg,Pa. U5 ....5.325
Detroit M1 .....5.325
Ecorse,Mich. G5 .....5.425
Fairfield,Ala. T2 .....5.325
Fairless,Pa. U5 .....5.375
Follansbee,W.Va. F4 ..5.325
Fontana,Calif. K1 ....7.075
Gary,Ind. U5 .....5.325
GraniteCity,Ill. G4 ....6.025
Ind.Harbor,Ind. I-2, Y1..5.325
Lackawanna,N.Y. B2 ..5.325
Mansfield,O. E6 .....5.325
Middletown,O. A10 ....5.325
Newport,Ky. N9 .....5.925
Pittsburg,Calif. C11 ..6.275
Pittsburgh J5 .....5.325
Portsmouth,O. P12 ....5.925
SparrowsPoint,Md. B2..5.325
Steubenville,O. W10 ...5.325
Warren,O. R2 .....5.325
Weirton,W.Va. W6 ....5.325
Youngstown Y1 .....5.325

SHEETS, Cold-Rolled
High-Strength, Low-Alloy

Cleveland J5, R2 .....7.875
Dravosburg,Pa. U5 ....7.875
Ecorse,Mich G5 .....7.975
Fairless,Pa. U5 .....7.925
Fontana,Calif. K1 ....9.625
Gary,Ind. U5 .....7.875
IndianaHarbor,Ind. Y1..7.875
Lackawanna(37) B2 ..7.875
Pittsburgh J5 .....7.875
SparrowsPoint(38) B2..7.875
Warren,O. R2 .....7.875
Weirton,W.Va. W6 ....7.875
Youngstown Y1 .....7.875

SHEETS, Cold-Rolled Ingot Iron

Middletown,O. A10 ....5.825

SHEETS, Culvert	Cu Alloy	Cu Fe
Ashland,Ky. A10	6.20	6.45
Canton,O. R2	...6.10	6.55
Dravosburg U5	.6.10	...
Fairfield T2	....6.10	...
Gary,Ind. U5	....6.10	6.35
Ind.Harbor I-2	..6.10	6.35
Kokomo,Ind. C16	.6.60	...
MartinsFry. W10	.6.10	...
Pitts.,Calif. C11	..6.85	...
SparrowsPt. B2	..6.10	...

SHEETS, Culvert—Pure Iron

Gary,Ind. U5 .....6.35
MartinaFry,O. W10 ....6.35

SHEETS, Galvanized Steel
Hot-Dipped

Ala.City,Ala. R2 .....5.85†
Ashland,Ky. A10 .....5.85†
Canton,O. R2 .....5.85‡
Dover,O. R1 .....5.85†
Dravosburg Pa. U5 ....5.85†
Fairfield, Ala. T2 ....5.85†
Gary Ind. U5 .....5.85†
GraniteCity,Ill. G4 ....6.65‡
Ind.Harbor,Ind. I-2 ...5.85†
Kokomo,Ind. C16 ....6.35†
MartinaFerry, O. W10..5.85*
Middletown,O. A10 ...5.85†
Pittsburg,Calif. C11 ..6.60*
Pittsburgh J5 .....5.85†
SparrowsPt.,Md. B2 ...5.85†
Warren,O. R2 .....5.85†
Weirton,W.Va. W6 ....5.85*

*Continuous and noncontinuous. †Continuous. ‡Noncontinuous.

SHEETS, Wall Casing

Fontana,Calif. K1 ....7.075

SHEETS, Galvanized
High-Strength Low-Alloy

Dravosburg,Pa. U5 ....8.60
SparrowsPoint(39) B2 ..8.60

SHEETS, Galvannealed Steel

Canton,O. R2 .....6.25
Dravosburg,Pa. U5 ....6.25
Kokomo,Ind. C16 .....7.00

SHEETS, Galvanized Ingot Iron
(Hot-dipped Continuous)

Ashland, Ky. A10 .....6.10
Middletown,O. A10 ....6.10

SHEETS, Electrogalvanized

Cleveland(28) R2 .....6.70
Niles,O.(28) R2 .....6.70
Weirton,W.Va. W6 ....6.55

SHEETS, Aluminum Coated

Butler,Pa. A10 (type 1)..8.50
Butler,Pa. A10 (type 2)..8.60

SHEETS, Enameling Iron

Ashland,Ky. A10 .....5.90
Cleveland R2 .....5.90
Dravosburg,Pa. U5 ....5.90
Gary,Ind. U5 .....5.90
GraniteCity,Ill. G4 ....6.60
Ind.Harbor,Ind. I-2 ....5.90
Middletown,O. A10 ....5.90
Niles,O. M21 .....5.90
Youngstown Y1 .....5.90

BLUED STOCK, 29 Gage

Follansbee,W.Va. F4 ....7.75
Ind.Harbor,Ind. I-2 ....7.75
Yorkville,O. W10 .....7.75

SHEETS, Long Terne Steel
(Commercial Quality)

BeechBottom,W.Va. W10 6.25
Gary,Ind. U5 .....6.25
Mansfield,O. E6 .....6.25
Middletown,O. A10 ....6.25
Niles,O. M21 .....6.25
Weirton,W.Va. W6 ....6.25

SHEETS, Long Terne, Ingot Iron

Middletown,O. A10 ....6.65

Key To Producers

A1 Acme Steel Co.
A3 Alan Wood Steel Co.
A4 Allegheny Ludlum Steel
A5 Alloy Metal Wire Div., H. K. Porter Co. Inc.
A6 American Shim Steel Co.
A7 American Steel & Wire Div., U. S. Steel Corp.
A8 Anchor Drawn Steel Co.
A9 Angell Nail & Chaplet
A10 Armco Steel Corp.
A11 Atlantic Steel Co.

B1 Babcock & Wilcox Co.
B2 Bethlehem Steel Co.
B3 Beth. Pac. Coast Steel
B4 Blair Strip Steel Co.
B5 Bliss & Laughlin Inc.
B8 Braeburn Alloy Steel
B9 Brainard Steel Div., Sharon Steel Corp.
B10 E. & G. Brooke, Wickwire Spencer Steel Div. Colo. Fuel & Iron
B11 Buffalo Bolt Co., Div., Buffalo-Eclipse Corp.
B12 Buffalo Steel Corp.
B14 A. M. Byers Co.
B15 J. Bishop & Co.

C1 Calstrip Steel Corp.
C2 Calumet Steel Div. Borg-Warner Corp.
C4 Carpenter Steel Co.
C7 Cleve. Cold Rolling Mills
C8 Cold Metal Products Co.
C9 Colonial Steel Co.
C10 Colorado Fuel & Iron
C11 Columbia-Geneva Steel
C12 Columbia Steel & Shaft.
C13 Columbia Tool Steel Co.
C14 Compressed Steel Shaft.
C15 Connors Steel Div. H. K. Porter Co. Inc.
C16 Continental Steel Corp.
C17 Copperweld Steel Co.
C18 Crucible Steel Co.
C19 Cumberland Steel Co.
C20 Cuyahoga Steel & Wire
C22 Claymont Steel Products Dept. Wickwire Spencer Steel Division
C23 Charter Wire Inc.
C24 G. O. Carlson Inc.

D2 Detroit Steel Corp.
D3 Detroit Tube & Steel Div., Sharon Steel Corp.
D4 Disston & Sons, Henry
D6 Driver-Harris Co.
D7 Dickson Weatherproof Nail Co.
D8 Damascus Tube Co.
D9 Wilbur B. Driver Co.

E1 EasternGas&FuelAssoc.
E2 Eastern Stainless Steel
E4 Electro Metallurgical Co.
E5 Elliott Bros. Steel Co.
E6 Empire Steel Corp.

F2 Firth Sterling Inc.
F3 Fitzsimmons Steel Co.
F4 Follansbee Steel Corp.
F5 Franklin Steel Div. Borg-Warner Corp.
F6 Fretz-Moon Tube Co.
F7 Ft. Howard Steel & Wire
F8 Ft. Wayne Metals Inc.

G2 Globe Iron Co.
G4 Granite City Steel Co.
G5 Great Lakes Steel Corp.
G6 Greer Steel Co.

H1 Hanna Furnace Corp.
H7 Helical Tube Co.

I-1 Igoe Bros. Inc.
I-2 Inland Steel Co.
I-3 Interlake Iron Corp.
I-4 Ingersoll Steel Div., Borg-Warner Corp.
I-6 Ivins, E., Steel Tube
I-7 Indiana Steel & Wire Co.

J1 Jackson Iron & Steel Co.
J3 Jessop Steel Co.
J4 Johnson Steel & Wire Co.
J5 Jones & Laughlin Steel
J6 Josiyn Mfg. & Supply
J7 Judson Steel Corp.
J8 Jersey Shore Steel Co.

K1 Kaiser Steel Corp.
K2 Keokuk Electro-Metals
K3 Keystone Drawn Steel
K4 Keystone Steel & Wire
K7 Kenmore Metals Corp.

L1 Laclede Steel Co.
L2 LaSalle Steel Co.
L3 Latrobe Steel Co.
L5 Lockhart Iron & Steel
L6 Lone Star Steel Co.
L7 Lukens Steel Co.

M1 McLouth Steel Corp.
M4 Mahoning Valley Steel
M6 Mercer Pipe Div., Sawhill Tubular Products
M8 Mid-States Steel & Wire
M12 Moltrup Steel Products
M13 Monarch Steel Div., Jones & Laughlin Steel Corp.
M14 McInnes Steel Co.
M16 Md. Fine&Special. Wire
M17 Metal Forming Corp.
M18 Milton Steel Division, Merritt-Chapman&Scott
M21 Mallory-Sharon Titanium Corp.

N1 National-Standard Co.
N2 National Supply Co.
N3 National Tube Div., U. S. Steel Corp.
N5 Nelsen Steel & Wire Co.
N6 New Eng. High Carb. Wire
N8 Newman-Crosby Steel
N9 Newport Steel Corp.
N14 Northwest.SteelRoll.Mills
N15 Northwestern S.&W. Co.
N16 New Delphos Mfg. Co.
N19 Northeastern Steel Corp.
O3 Oliver Iron & Steel Corp.
O4 Oregon Steel Mills

P1 PacificStatesSteelCorp.
P2 Pacific Tube Co.
P4 Phoenix Iron & Steel Co. Sub. of Barium Steel Corp.
P5 Pilgrim Drawn Steel
P6 Pittsburgh Coke&Chem.
P7 Pittsburgh Steel Co.
P11 Pollak Steel Co.
P12 Portsmouth Division, Detroit Steel Corp.
P13 Precision Drawn Steel
P14 Pitts. Screw & Bolt Co.
P15 Pittsburgh Metallurgical
P16 Page Steel & Wire Div., Amer. Chain & Cable
P17 Plymouth Steel Co.
P19 Pitts. Rolling Mills
P20 Prod. Steel Strip Corp.
P22 Phoenix Mfg. Co.

R1 Reeves Steel & Mfg. Co.
R2 Republic Steel Corp.
R3 Rhode Island Steel Corp.
R5 Roebling's Sons, John A.
R6 Rome Strip Steel Co.
R7 Rotary Electric Steel Co.
R8 Reliance Div.,EatonMfg.
R9 Rome Mfg. Co.
R10 Rodney Metals Inc.

S1 Seneca Wire & Mfg. Co.
S3 Sharon Steel Corp.
S4 Sharon Tube Co.
S5 Sheffield Steel Div., Armco Steel Corp.
S6 Shenango Furnace Co.
S7 Simmons Co.
S8 Simonds Saw & Steel Co.
S12 Spencer Wire Corp.
S13 Standard Forgings Corp.
S14 Standard Tube Co.
S15 Stanley Works
S17 Superior Drawn Steel Co.
S18 Superior Steel Corp.
S19 Sweet's Steel Co.
S20 Southern States Steel
S23 Superior Tube Co.
S25 Stainless Welded Prod.
S26 Specialty Wire Co. Inc.
S30 Sierra Drawn Steel Corp.
S40 Seneca Steel Service

T2 Tenn. Coal & Iron Div., U. S. Steel Corp.
T3 Tenn. Prod. & Chem.
T4 Texas Steel Co.
T5 Thomas Strip Division, Pittsburgh Steel Co.
T6 Thompson Wire Co.
T7 Timken Roller Bearing
T9 Tonawanda Iron Div. Am. Rad. & Stan. San.
T13 Tube Methods Inc.
T19 Techalloy Co. Inc.

U4 Universal-Cyclops Steel
U5 United States Steel Corp.
U6 U. S. Pipe & Foundry
U7 Ulbrich Stainless Steels
U8 U. S. Steel Supply Div. U. S. Steel Corp.

V2 Vanadium-Alloys Steel
V3 Vulcan Crucible Div., H. K. Porter Co. Inc.

W1 Wallace Barnes Co.
W2 Wallingford Steel Co.
W3 Washburn Wire Co.
W4 Washington Steel Corp.
W6 Weirton Steel Co.
W7 W. Va. Steel & Mfg. Co.
W8 Western Automatic Machine Screw Co.
W9 Wheatland Tube Co.
W10 Wheeling Steel Corp.
W12 Wickwire Spencer Steel Div., Colo. Fuel & Iron
W13 Wilson Steel & Wire Co.
W14 Wisconsin Steel Div., International Harvester
W15 Woodward Iron Co.
W18 Wyckoff Steel Co.
W19 Worcester Pressed Steel

Y1 Youngstown Sheet&Tube

STRIP

STRIP, Hot-Rolled Carbon

Ala.City,Ala.(27) R2	4.325
Allenport,Pa. P7	4.325
Alton,Ill. L1	4.50
Ashland,Ky.(8) A10	4.325
Atlanta A11	4.525
Bessemer,Ala. T2	4.325
Birmingham C15	4.825
Bridgeport,Conn. N19	4.625
Buffalo(27) R2	4.325
Conshohocken,Pa. A3	4.775
Detroit M1	4.425
Ecorse,Mich. G5	4.425
Fairfield,Ala. T2	4.325
Fontana,Calif. K1	5.575
Gary,Ind. U5	4.325
Ind.Harbor,Ind. I-2, Y1	4.325
Johnstown,Pa.(25) B2	4.325
Lackaw'na,N.Y.(24) B2	4.325
LosAngeles (25) B3	5.075
Minnequa,Colo. C10	5.425
Pittsburg,Calif. C11	5.075
Riverdale,Ill. A1	4.725
SanFrancisco S7	5.65
Seattle(25) B3	5.325
Seattle N14	5.40
Sharon,Pa. S3	4.325
S. Chicago,Ill. W14	4.575
S.SanFrancisco(25) B3	5.075
SparrowsPoint,Md. B2	4.325
Sterling,Ill.(1) N15	4.325
Sterling,Ill. N15	4.425
Torrance,Calif. C11	5.075
Warren,O. R2	4.325
Weirton,W.Va. W6	4.325
Youngstown U5	4.325

STRIP, Hot-Rolled Alloy

Bridgeport,Conn. N19	7.50
Carnegie,Pa. S18	7.20
Fontana,Calif. K1	9.65
Gary,Ind. U5	7.20
Ind.Harbor,Ind. Y1	7.20
LosAngeles B3	8.40
Newport Ky. N9	7.90
Sharon,Pa. S3	7.20
S.Chicago W14	7.45
Youngstown U5, Y1	7.20

STRIP, Hot-Rolled High-Strength, Low-Alloy

Bessemer,Ala. T2	6.425
Conshohocken,Pa. A3	6.825
Ecorse,Mich. G5	6.525
Fairfield,Ala. T2	6.425
Fontana,Calif. K1	8.025
Gary,Ind. U5	6.425
Houston S5	6.675
Ind.Harbor,Ind. I-2,Y1	6.425
KansasCity,Mo. S5	6.675
Lackawanna,N.Y. B2	6.425
LosAngeles(25) B3	7.175
Seattle(25) B3	7.425
Sharon Pa. S3	6.425
S.SanFrancisco(25) B3	7.175
SparrowsPoint,Md. B2	6.425
Warren,O. R2	6.425
Weirton,W.Va. W6	6.425
Youngstown U5, Y1	6.425

STRIP, Hot-Rolled Ingot Iron

Ashland,Ky.(8) A10	4.575

STRIP, Cold-Rolled Carbon

Anderson,Ind. G6	6.85
Baltimore T6	6.25
Boston T6	6.80
Buffalo S40	6.25
Cleveland A7, J5	6.25
Conshohocken,Pa. A3	6.70
Dearborn,Mich. D3	6.35
Detroit M1, P20	6.35
Detroit D2	6.95
Dover,O. G6	6.85
Ecorse,Mich. G5	6.35
Follansbee,W.Va. F4	6.25
Fontana,Calif. K1	8.70
FranklinPark,Ill. T6	6.35
Ind.Harbor,Ind. I-2	6.35
Ind.Harbor,Ind. Y1	6.25
Indianapolis C8	6.40
Lackawanna,N.Y. B2	6.25
LosAngeles C1	8.30
NewBedford,Mass. R10	6.70
NewBritain(10) S15	6.25
NewCastle,Pa. B4, E5	6.25
NewHaven,Conn. A7	6.70
NewHaven,Conn. D2	7.30
NewKensington,Pa. A8	6.25
Pawtucket,R.I. R3	6.90
Pawtucket,R.I. N8	6.80
Pittsburgh J5	6.25
Riverdale,Ill. A1	6.95
Rome,N.Y. (32) R6	6.25
Sharon,Pa. S3	6.25
SparrowsPt.,Md. B2	6.25
Trenton,N.J.(31) R5	7.80
Wallingford,Conn. W2	6.70
Warren,O. R2, T5	6.25
Weirton,W.Va. W6	6.25
Worcester,Mass. A7	6.80
Youngstown C8, Y1	6.25

STRIP, Cold-Rolled Alloy

Boston T6	13.80
Carnegie,Pa. S18	13.45
Cleveland A7	13.45
Dover,O. G6	13.45
FranklinPark,Ill. T6	13.45
Harrison,N.J. C18	13.45
Indianapolis C8	13.60
Pawtucket,R.I. N8	13.80
Sharon,Pa. S3	13.45
Worcester,Mass. A7	13.75
Youngstown C8	13.45

STRIP, Cold-Rolled High-Strength, Low-Alloy

Cleveland A7	9.10
Dearborn,Mich. D3	9.20
Dover,O. G6	9.30
Ecorse,Mich. G5	9.20

STRIP, Cold-Finished Spring Steel (Annealed)	**0.26-0.40C**	**0.41-0.60C**	**0.61-0.80C**	**0.81-1.05C**	**1.06-1.35C**
Baltimore T6	7.40	9.35	10.90	13.05	15.75
Boston T6	7.65	9.35	10.90	13.05	15.75
Bristol,Conn. W1	...	...	10.90	13.05	15.75
Carnegie,Pa. S18	...	9.05	10.60	12.75	...
Cleveland A7	7.10	9.05	10.60	12.75	15.45
Cleveland C7	...	9.05	10.60	12.75	15.45
Dearborn,Mich. D3	7.20	9.15	10.70	...	...
Detroit D2	7.20	9.15	10.70	12.85	...
Dover,O. G6	7.10	9.05	10.60	12.75	15.45
FranklinPark,Ill. T6	7.20	9.06	10.60	12.75	15.45
Harrison,N.J. C18	...	...	10.90	13.05	15.75
Indianapolis C8	7.25	9.20	10.60	12.75	15.45
NewBritain,Conn.(10) S15	7.10	9.05	10.60	12.75	15.45
NewCastle,Pa. B4, E5	7.10	9.05	10.60	12.75	...
NewHaven,Conn. D2	7.55	9.35	10.90	13.05	...
NewKensington,Pa. A6	7.10	9.05	10.60	...	...
NewYork W3	...	9.35	10.90	13.05	15.75
Pawtucket,R.I. N8	7.65	9.35	10.90	13.05	15.75
Riverdale,Ill. A1	7.20	9.05	10.60	12.75	15.45
Rome,N.Y. (32) R6	7.10	9.05	10.60	12.75	15.45
Sharon,Pa. S3	7.10	9.05	10.60	12.75	15.45
Trenton,N.J. R5	...	9.35	10.90	13.05	15.75
Wallingford,Conn. W2	7.55	9.35	10.90	13.05	15.75
Warren,O. T5	7.10	9.05	10.60	12.75	15.45
Weirton,W.Va. W6	7.10	9.05	10.60	12.75	15.45
Worcester,Mass. A7, T6	7.65	9.35	10.90	13.05	15.75
Youngstown C8	7.10	9.05	10.60	12.75	15.45
Spring Steel (Tempered)					
Bristol Conn. W1	...	...	14.80	18.15	...
Buffalo W12	...	...	14.80	...	...
FranklinPark,Ill. T6	...	...	15.15	18.50	22.35
Harrison,N.J. C18	...	...	14.80	18.15	22.00
NewYork W3	...	...	14.80	18.15	22.00
Trenton,N.J. R5	...	...	14.80	18.15	22.00
Worcester,Mass. W12	...	...	14.80	...	...
Worcester,Mass. A7, T6	...	...	14.80	18.15	22.00
Youngstown C8	...	...	15.15	18.50	22.35

STRIP, Galvanized (Continuous)

Sharon,Pa. S3	6.55

TIGHT COOPERAGE HOOP

Atlanta A11	5.05
Riverdale,Ill. A1	4.90
Sharon,Pa. S3	4.75
Youngstown U5	4.75
Ind.Harbor,Ind. Y1	9.30
Lackawanna,N.Y. B2	9.10
Sharon,Pa. S3	9.10
SparrowsPoint,Md. B2	9.10
Warren,O. R2	9.10
Weirton,W.Va. W6	9.10
Youngstown Y1	9.30

STRIP, Electrogalvanized

Cleveland A7	6.25*
Dover,O. G6	6.85*
Riverdale,Ill. A1	6.35*
Warren,O. B9, T5	6.25*
Worcester,Mass. A7	6.80*
Youngstown C8	6.25*

*Plus galvanizing extras.

SILICON STEEL

H.R. SHEETS(22 Ga.,cut lengths)	Field	Armature	Electric	Motor	Dynamo
BeechBottom,W.Va. W10	...	...	9.95	10.95	11.85
Brackenridge,Pa. A4	...	...	9.95	10.95	11.85
Mansfield,O. E6	8.40	9.35	9.95	10.95	11.85
Newport,Ky. N9	9.00	9.95	10.55	11.55	12.45
Niles,O. M21	8.40	9.35	9.95	10.95	...
Vandergrift,Pa. U5	...	9.35	9.95	10.95	11.85
Warren,O. R2	8.40	9.35	9.95	10.95	11.85
Zanesville,O. A10	...	9.35	9.95	10.95	11.85

C.R. COILS & CUT LENGTHS, (22 Ga.) Fully Processed (Semiprocessed ½c lower)	Field	Armature	Electric	Motor	Dynamo
Brackenridge,Pa. A4	...	...	10.70	11.70	12.60
GraniteCity,Ill. G4	9.30*	10.30*	10.90*	11.90*	...
IndianaHarbor,Ind. I-2	8.60†	9.60*	10.20*	11.20*	...
Vandergrift,Pa. U5	8.60*	9.60*	10.20*	11.20*	12.10*
Vandergrift,Pa. U5	...	10.10†	10.70†	11.70†	12.60†
Warren,O. R2	8.60†	10.10	10.70	11.70	12.60

H.R. SHEETS (22 Ga., cut lengths)	Transformer Grade T-72	T-65	T-58	T-52
BeechBottom,W.Va. W10	12.80	13.35	13.65	14.85
Brackenridge,Pa. A4	12.80	...	...	...
Vandergrift,Pa. U5	12.80	13.35	13.65	14.85
Zanesville,O. A10	12.80§	13.35§	13.65§	14.85§

C.R. COILS & CUT LENGTHS (22 Ga.)	Grain Oriented T-100	T-90	T-80	T-73	T-66	T-73
Brackenridge,Pa. A4	....	15.85	17.45	17.95	18.45	13.55**
Butler,Pa. A10	....	....	17.45	17.95	....	....
Vandergrift,Pa. U5	14.85	15.85	17.45	17.95	....	13.55**
Warren,O. R2	....	....	....	....	....	13.55†

*Semiprocessed, †Fully processed only. ‡Coils, annealed, semiprocessed ½c lower. §Coils, ¾-cent higher. **Cut lengths, ¾-cent lower.

TIN MILL PRODUCTS

TIN PLATE Electrolytic (Base Box)	0.25 lb	0.50 lb	0.75 lb
Aliquippa,Pa. J5	$8.30	$8.55	$8.95
Dravosburg,Pa. U5	8.30	8.55	8.95
Fairfield,Ala. T2	8.40	8.65	9.05
Fairless,Pa. U5	8.40	8.65	9.05
Fontana,Calif. K1	9.05	9.30	9.70
Gary,Ind. U5	8.30	8.55	8.95
GraniteCity,Ill. G4	8.40	8.65	9.05
IndianaHarbor,Ind. I-2, Y1	8.30	8.55	8.95
Niles,O. R2	8.30	8.55	8.95
Pittsburg,Calif. C11	9.05	9.30	9.70
SparrowsPoint,Md. B2	8.40	8.65	9.05
Weirton,W.Va. W6	8.30	8.55	8.95
Yorkville,O. W10	8.30	8.55	8.95

ELECTROTIN (22-37 Gage; Dollars per 100 lb)			
Aliquippa,Pa. J5	6.975	....	....
Niles,O. R2	6.975	7.175	7.375

TINPLATE, American	1.25 lb	1.50 lb
Aliquippa,Pa. J5	$9.60	$9.85
Dravosburg,Pa. U5	9.60	9.85
Fairfield,Ala. T2	9.70	9.95
Fairless,Pa. U5	9.70	9.95
Fontana,Calif. K1	10.35	10.60
Gary,Ind. U5	9.60	9.85
Ind.Har. I-2, Y1	9.60	9.85
Pitts.,Calif. C11	10.35	10.60
Sp.Pt.,Md. B2	9.70	9.95
Weirton,W.Va. W6	9.60	9.85
Yorkville,O. W10	9.60	9.85

BLACK PLATE (Base Box)	
Aliquippa,Pa. J5	$7.40
Dravosburg,Pa. U5	7.40
Fairfield,Ala. T2	7.50
Fairless,Pa. U5	7.50
Fontana,Calif. K1	8.15
Gary,Ind. U5	7.40
GraniteCity,Ill. G4	7.50
Ind.Harbor,Ind. I-2, Y1	7.40
Niles,O. R2	7.40
Pittsburg,Calif. C11	8.15
SparrowsPoint,Md. B2	7.50
Warren,O. R2	7.40
Weirton,W.Va. W6	7.40
Yorkville,O. W10	7.40

HOLLOWARE ENAMELING Black Plate (29 Gage)

Dravosburg,Pa. U5	6.65
Gary,Ind. U5	6.65
GraniteCity,Ill. G4	7.25
Ind.Harbor,Ind. Y1	6.65
Yorkville,O. W10	6.65

MANUFACTURING TERNES (Special Coated; Base Box)

Dravosburg,Pa. U5	$9.10
Gary,Ind. U5	9.10
Yorkville,O. W10	9.10

MANUFACTURING TERNES (Light Coated, 6 lb; Base Box)

Yorkville,O. W10	$9.55

ROOFING SHORT TERNES (8 lb Coated; Base Box)

Gary,Ind. U5	$10.65

WIRE

WIRE, Manufacturers Bright, Low Carbon

AlabamaCity,Ala. R2	6.60
Aliquippa,Pa. J5	6.60
Alton,Ill. L1	6.775
Atlanta A11	6.80
Bartonville,Ill. K4	6.70
Buffalo W12	6.60
Chicago W13	6.60
Cleveland A7	6.60
Crawfordsville,Ind. M8	6.70
Donora,Pa. A7	6.60
Duluth,Minn. A7	6.60
Fairfield,Ala. T2	6.60
Fostoria,O.(24) S1	6.60
Houston S5	6.65
Jacksonville,Fla. M8	6.95
Johnstown,Pa. B2	6.60
Joliet,Ill. A7	6.60
KansasCity,Mo. S5	6.65
Kokomo,Ind. C16	7.20
LosAngeles B3	7.55
Minnequa,Colo. C10	6.85
Monessen,Pa. P7	6.60
Newark 6-8 ga. I-1	6.90
N.Tonawanda B11	6.60
Palmer,Mass. W12	6.90
Pittsburg,Calif. C11	7.55
Portsmouth,O. P12	7.10
Rankin,Pa. A7	6.60
S.Chicago,Ill. R2	6.60
S.SanFrancisco C10	7.55
SparrowsPoint,Md. B2	6.70
Sterling,Ill.(1) N15	6.60
Sterling,Ill. N15	6.70
Struthers,O. Y1	6.60
Waukegan,Ill. A7	6.60
Worcester,Mass. A7	6.90

WIRE, MB Spring, High Carbon

Aliquippa,Pa. J5	7.90
Alton,Ill. L1	8.075
Bartonville,Ill. K4	8.00
Buffalo W12	7.90
Cleveland A7	7.90
Donora,Pa. A7	7.90
Duluth,Minn. A7	7.90
Fostoria,O. S1	7.95
Johnstown,Pa. B2	7.90
LosAngeles B3	8.85
Millbury,Mass.(12) N6	8.20
Minnequa,Colo. C10	8.15
Monessen,Pa. P7, P16	7.90
Muncie,Ind. I-7	8.10
Palmer,Mass. W12	8.20
Pittsburg,Calif. C11	8.85
Portsmouth,O. P12	8.60
Roebling,N.J. R5	8.20
S.Chicago,Ill. R2	7.90
S.SanFrancisco C10	8.85
SparrowsPt.,Md. B2	8.00
Struthers,O. Y1	7.90
Trenton,N.J. A7	8.20
Waukegan,Ill. A7	7.90
Worcester A7,J4,T6,W12	8.20

WIRE, Upholstery Spring

Aliquippa,Pa. J5	7.60
Alton,Ill. L1	7.775
Buffalo W12	7.60
Cleveland A7	7.60
Donora,Pa. A7	7.60
Duluth,Minn. A7	7.60
Johnstown,Pa. B2	7.60
KansasCity,Mo. S5	7.85
LosAngeles B3	8.55
Minnequa,Colo. C10	7.775
Monessen,Pa. P7, P16	7.60
NewHaven,Conn. A7	7.90
Palmer,Mass. W12	7.90
Pittsburg,Calif. C11	8.55
Portsmouth,O. P12	8.30
Roebling,N.J. R5	7.90
S.Chicago,Ill. R2	7.60
S.SanFrancisco C10	8.55
SparrowsPoint,Md. B2	7.70
Struthers,O. Y1	7.60
Trenton,N.J. A7	7.90
Waukegan,Ill. A7	7.60
Worcester,Mass. A7	7.90

WIRE, Fine & Weaving (8" Coils)

Alton,Ill. L1	12.725
Bartonville,Ill. K4	12.65
Buffalo W12	12.55
Chicago W13	12.55
Cleveland A7	12.55
Crawfordsville,Ind. M8	12.65
Fostoria,O. S1	12.55
Jacksonville,Fla. M8	12.90
Johnstown,Pa. B2	12.55
Kokomo,Ind. C16	13.05
Minnequa,Colo. C10	12.30
Monessen,Pa. P6	12.55
Muncie,Ind. I-7	12.75
Palmer,Mass. W12	12.85
Roebling,N.J. R5	12.85
S.SanFrancisco C10	12.90
Waukegan,Ill. A7	12.55
Worcester,Mass. A7,T6	12.85

WIRE, Gal'd ACSR for Cores

Bartonville,Ill. K4	10.70
Buffalo W12	10.70
Johnstown,Pa. B2	10.70
Minnequa,Colo. C10	10.825
Monessen,Pa. P16	10.70
Muncie,Ind. I-7	10.90
Palmer,Mass. W12	11.00
Pittsburg,Calif. C11	11.80
Portsmouth,O. P12	11.50
Roebling,N.J. R5	11.00
SparrowsPt.,Md. B2	10.80
Struthers,O. Y1	10.70

ROPE WIRE (A)

Bartonville,Ill. K4	10.55
Buffalo W12	10.55
Fostoria,O. S1	10.55
Johnstown,Pa. B2	10.55
Monessen,Pa. P7, P16	10.55
Muncie,Ind. I-7	10.75
Palmer,Mass. W12	10.85
Portsmouth,O. P16	11.35
Roebling,N.J. R5	10.85
SparrowsPt. B2	10.65
Struthers,O. Y1	10.55
Worcester,Mass. J4	10.85

(A) Plow and Mild Plow; add 0.25c for Improved Plow.

WIRE

(Continued)

WIRE, Tire Bead

Bartonville,Ill. K4	14.15
Monessen,Pa. P16	14.20
Roebling,N.J. R5	14.35

WIRE, Cold-Rolled Flat

Anderson,Ind. G6	10.25
Baltimore T6	9.80
Boston T6	9.80
Buffalo W12	9.50
Cleveland A7	9.50
Crawfordsville,Ind. M8	9.50
Dover,O. G6	10.25
Fostoria,O. S1	9.50
FranklinPark,Ill. T6	9.60
Kokomo,Ind. C16	9.50
Massillon,O. R8	9.50
Milwaukee C23	9.70
Monessen,Pa. P7, P16	9.50
Pawtucket,R.I. N8	9.80
Riverdale,Ill. A1	9.60
Rome,N.Y. R6	9.50
Trenton,N.J. R5	9.80
Worcester A7, T6, W12	9.80

NAIL, Stock

To Dealers & Mfrs. (7)	Col.
AlabamaCity,Ala. R2	152
Aliquippa,Pa. J5	152
Atlanta A11	154
Bartonville,Ill. K4	154
Chicago,Ill. W13	152
Cleveland A9	157
Crawfordsville,Ind. M8	154
Donora,Pa. A7	152
Duluth,Minn. A7	152
Fairfield,Ala. T2	152
Galveston,Tex. D7	157
Houston,Tex. S5	157
Jack'ville,Fla.(20) M8	163
Johnstown,Pa. B2	152
Joliet,Ill. A7	152
KansasCity,Mo. S5	157
Kokomo,Ind. C16	169
Minnequa,Colo. C10	167
Monessen,Pa. P7	152
Pittsburg,Calif. C11	171
Rankin,Pa. A7	152
S.Chicago,Ill. R2	152
SparrowsPt.,Md. B2	154
Sterling,Ill.(1) N15	152
Worcester,Mass. A7	158

NAILS, Cut (100 lb keg)

To Dealers (33)	
Conshohocken,Pa. A3	$9.05
Wheeling,W.Va. W10	9.05

STAPLES, Polished Stock

To Dealers & Mfrs. (7)	Col.
AlabamaCity,Ala. R2	152
Aliquippa,Pa. J5	152
Atlanta A11	154
Bartonville,Ill. K4	154
Crawfordsville,Ind. M8	154
Donora,Pa. A7	152
Duluth,Minn. A7	152
Fairfield,Ala. T2	152
Jack'ville,Fla.(20) M8	163
Johnstown,Pa. B2	152
Joliet,Ill. A7	152
Kokomo,Ind. C16	169
Minnequa,Colo. C10	167
Monessen,Pa. P7	152
Pittsburg,Calif. C11	171
Rankin,Pa. A7	152
S.Chicago,Ill. R2	152
SparrowsPt.,Md. B2	154
Sterling,Ill.(1) N15	152
Worcester,Mass. A7	158

TIE WIRE, Automatic Baler (14½ Ga.)(Per 97 lb Net Box)

Coil No. 3150	
AlabamaCity,Ala. R2	$9.45
Bartonville,Ill. K4	9.45
Buffalo W12	9.45
Crawfordsville,Ind. M8	9.55
Donora,Pa. A7	9.45
Duluth,Minn. A7	9.45
Jacksonville,Fla. M8	10.01
Johnstown,Pa. B2	9.45
Joliet,Ill. A7	9.45
Kokomo,Ind. C16	9.55
LosAngeles B3	10.24
Minnequa,Colo. C10	*9.70*
Pittsburg,Calif. C11	10.23
S.Chicago,Ill. R2	9.45
SparrowsPt.,Md. B2	9.55
Sterling,Ill. N15	9.35

Coil No. 6300 Stand.	
AlabamaCity,Ala. R2	$9.75
Bartonville,Ill. K4	9.75
Buffalo W12	9.75
Crawfordsville,Ind. M8	9.85
Donora,Pa. A7	9.75
Duluth,Minn. A7	9.75
Jacksonville,Fla. M8	10.31
Johnstown,Pa. B2	9.75
Joliet,Ill. A7	9.75
Kokomo,Ind. C16	9.85
LosAngeles B3	10.55
Minnequa,Colo. C10	*10.00*
Pittsburg,Calif. C11	10.55
S.Chicago,Ill. R2	9.75
SparrowsPt.,Md. B2	9.85
Sterling,Ill. N15	9.65

Coil No. 6500 Interim	
AlabamaCity,Ala. R2	$9.80
Bartonville,Ill. K4	9.80
Buffalo W12	9.80
Crawfordsville,Ind. M8	9.90
Donora,Pa. A7	9.80
Duluth,Minn. A7	9.80
Jacksonville,Fla. M8	10.36
Johnstown,Pa. B2	9.80
Joliet,Ill. A7	9.80
Kokomo,Ind. C16	9.90
LosAngeles B3	10.60
Minnequa,Colo. C10	*10.05*
Pittsburg,Calif. C11	10.60
S.Chicago,Ill. R2	9.80
SparrowsPt.,Md. B2	9.90
Sterling,Ill. N15	9.70

WIRE, Barbed

	Col.
AlabamaCity,Ala. R2	175**
Aliquippa,Pa. J5	172†
Atlanta A11	181
Bartonville,Ill. K4	181
Crawfordsville,Ind. M8	181
Donora,Pa. A7	175†
Duluth,Minn. A7	175†
Fairfield,Ala. T2	175†
Houston,Tex. S5	180**
Jacksonville,Fla. M8	186
Johnstown,Pa. B2	179*
Joliet,Ill. A7	175†
KansasCity,Mo. S5	180**
Kokomo,Ind. C16	193†
Minnequa,Colo. C10	180**
Monessen,Pa. P7	178††
Pittsburg,Calif. C11	195†
Rankin,Pa. A7	175†
S.Chicago,Ill. R2	175**
S.SanFrancisco C10	195**
SparrowsPoint,Md. B2	181*
Sterling,Ill.(1) N15	179††

WOVEN FENCE, 9-15 Ga.

	Col.
Ala.City,Ala. R2	162**
Aliq'ppa,Pa.9-14½ga.J5	165‡
Atlanta A11	168
Bartonville,Ill. K4	168
Crawfordsville,Ind. M8	168
Donora,Pa. A7	162†
Duluth,Minn. A7	162†
Fairfield,Ala. T2	162†
Houston,Tex. S5	167**
Jacksonville,Fla. M8	173
Johnstown,Pa.(43) B2	166
Joliet,Ill. A7	162†
KansasCity,Mo. S5	167**
Kokomo,Ind. C16	180†
Minnequa,Colo. C10	167**
Monessen,Pa. 9 ga. P7	166††
Pittsburg,Calif. C11	185†
Rankin,Pa. A7	162†
S.Chicago,Ill. R2	162**
Sterling,Ill.(1) N15	166††

WIRE (16 Gage)	An'ld Galv. Stone	Stone
Ala.City R2	14.50	16.05**
Bartonville K4	14.50	16.55
Buffalo W12	14.50	
Cleveland A7	14.50	
Crawf'dsville M8	16.50	16.55
Fostoria,O. S1	14.60	16.15†
Jacksonville M8	14.85	16.80
Johnstown B2	14.50	16.40*
Kokomo C16	15.10	16.65†
Minnequa C10	*14.35*	*16.55***
Palmer,MassW12	14.50	16.05*
Pitts.,Calif. C11	14.85	16.40†
S.Chicago R2	14.50	16.05**
SparrowsPt. B2	14.60	16.50*
Sterling(1) N15	14.50	16.45††
Waukegan A7	14.50	16.05
Worcester A7	14.80	

WIRE, Merchant Quality

(6 to 8 gage)	An'ld Galv.
Ala.City,Ala. R2	7.50 790**
Aliquippa J5	7.40 7.925‡
Atlanta A11	7.60 8.20
Bartonville(48) K4	7.60 8.20
Buffalo W12	7.50 7.90†
Cleveland A7	7.50
Crawfordsville M8	7.60 8.20
Donora,Pa. A7	7.50 7.90†
Duluth,Minn. A7	7.50 7.90†
Fairfield T2	7.50 7.90†
Houston(48) S5	7.65 8.05**
Jacks'ville,Fla. M8	7.85 8.45
Johnstown B2(48)	7.50 8.10*
Joliet,Ill. A7	7.50 7.90†
Kans.City(48) S5	7.65 8.05**
Kokomo C16	8.10 8.50
LosAngeles B3	8.45 9.05*
Minnequa C10	*7.75 8.15***
Monessen P7(48)	7.40 8.00††
Palmer,Mass. W12	7.80 8.20†
Pitts.,Calif. C11	8.45 8.85†
Portsmouth,O. P12	8.90
Rankin,Pa. A7	7.50 7.90†
S.Chicago R2	7.50 7.90**
S.SanFran. C10	8.35 8.75**
SparwsPt. B2(48)	7.60 8.20*
Str'ling(1)(48) N15	7.40 8.00††
Struth'rs,O(48) Y1	7.50 8.00‡
Worcester,Mass. A7	7.50 8.20†

Based on zinc price of: *13.50c. †5c. ‡10c. ‖Less than 10c. ††13c. **Subject to zinc equalization extras.

BALE TIES, Single Loop

	Col.
AlabamaCity,Ala. R2	175
Atlanta A11	175
Bartonville,Ill. K4	177
Crawfordsville,Ind. M8	177
Donora,Pa. A7	175
Duluth,Minn. A7	175
Fairfield,Ala. T2	175
Jacksonville,Fla. M8	182
Joliet,Ill. A7	175
Houston 85	178
KansasCity,Mo. S5	178
Kokomo,Ind. C16	179
Minnequa,Colo C10	*180*
Pitts.,Calif. C11	199
S.Chicago R2	175
S.SanFran.Calif. C10	197
SparrowsPoint,Md. B2	177
Sterling,Ill.(1) N15	173

FENCE POSTS

	Col.
ChicagoHts.,Ill. C2, I-2	157
Duluth,Minn. A7	157
Franklin,Pa. F5	157
Huntington,W.Va. W7	157
Johnstown,Pa. B2	157
Marion,O. P11	157
Minnequa,Colo. C10	162
Moline,Ill. R2	162
S.Chicago,Ill. R2	157
Tonawanda,N.Y. B12	157
Williamsport,Pa. S10	*175*

FASTENERS

(Base discounts, full case quantity, per cent off list to consumer, f.o.b. mill)

Carriage, Machine Bolts

Full-Size Body (cut thread)	
†⅛" x 6" and smaller	61
Larger than ½" diam. and all diams. longer than 6"	55
Under-Size Body (rolled thread; not nutted):	
¼" x 6" and smaller.	61

†⅛" x 4" and smaller and shorter are not nutted.

Carriage, Machine & Lag Bolts, Hot Galvanized:

½" and smaller	42
Larger than ½" diam. and all diams. longer than 6"	32

Lag Bolts

All diams. & 6" and shorter	61
All diams. longer than 6"	55

Plow, Tap & Blank Bolts

⅛" x 6" and smaller.	61
Larger than ½" diam. and all diams. longer than 6"	55

Ribbed Neck, Carriage, Step, Elevator, Fitting-up and Tire Bolts:

All sizes	61

STOVE BOLTS, SLOTTED

(Nuts not attached; bulk)

⅛" to ¼" diam. incl., 3" or shorter:	
25,000 to 199,999 pieces	61
200,000 or more pieces	64
5/16" to ⅜" diam., incl., 3" or shorter:	
15,000 to 99,999 pieces	61
100,000 or more pieces	64
Longer than 3", any diam.:	
5000 to 99,999 pieces.	61
100,000 or more pieces	64

MACHINE SCREWS, SLOTTED (Bulk)

No. 2 to ¼" diam. incl.:	
25,000 to 199,999 pieces	20
200,000 or more pieces	27
5/16" to ⅜" diam. incl.:	
15,000 to 99,999 pieces	20
100,000 or more	27

CAP SCREWS

(New Std., hexagon head, upset, packages)

Bright:

6" and shorter:	
¼" through ⅝" diam.	34
¾" & ⅞" diam.	31
1", 1⅛", 1¼"	8
Longer than 6":	
¼" through ⅝" diam.	3
¾" through 1" diam.	+13

High Carbon, Heat-treated:

6" and shorter:	
¼" through ⅝" diam.	20
¾" & ⅞" diam.	16
1", 1⅛", 1¼"	+11
Longer than 6":	
¼" through ⅝" diam.	+23
¾" through 1" diam.	+41

(New Std. Hexagon head, upset, bulk)

Bright:

⅛" x 6" & smaller & shorter	49
7/16", ½", ⅝" diam. x 6" & shorter	48
⅝", ¾", 1" x 6" & shorter	31

High Carbon, Heat-treated:

⅛" x 6" & smaller & shorter	41
7/16" x ⅝" diam. & 6" & shorter	39
⅝", ¾", 1" x 6" & shorter	20

NUTS

Reg. & Heavy Square Nuts:

All sizes	61

H.P. Reg. & Heavy Hex Nuts:

⅜" & smaller	64
⅞" to 1½" incl.	63
1⅝" to 1⅞" incl.	65
1⅝" & larger	61

C.P. Reg. & Heavy Hex Nuts

⅜" & smaller	64
⅞" & larger	61

Semifinished & Finished Nuts

⅝" & smaller	66
⅞" & larger	63

Semifinished Slotted Reg. & Heavy Hex Nuts

⅝" & smaller	66
¾" & larger	63

Hot Galvanized Nuts, all types

1⅛" & smaller	44

(On above items, add 25% for less than case quantities)

MACHINE SCREW NUTS & STOVE BOLT NUTS (Bulk)

No. 2 to ⅝" incl., Square:	
25,000 to 199,999 pieces	20
200,000 or more pieces	27
No. 2 to ⅝" incl., Hex.:	
25,000 to 199,999 pieces	18
200,000 or more pieces	25

RIVETS

F.o.b. Cleveland and/or freight equalized with Pittsburgh, f.o.b. Chicago, and/or freight equalized with Birmingham except where equalization is too great.

Structural ½-in., larger 9.95

7/16-in. under. List less 32%

BOILER TUBES

Net base c.l. prices, dollars per 100 ft, mill; minimum wall thickness, cut lengths 10 to 24 ft, inclusive.

O.D. In.	B.W. Gage	Seamless H.R.	Seamless C.D.	Elec. Weld H.R.
1	13	....	21.55	20.90
1¼	13	....	25.53	21.25
1½	13	24.24	28.22	23.50
1⅝	13	28.63	33.34	27.76
2	13	32.09	37.37	31.13
2¼	13	36.14	42.09	35.05
2½	12	39.23	45.67	38.05
2½	12	43.22	50.31	41.91
2¾	12	46.79	54.48	45.38
3	12	49.90	58.10	48.39

RAILWAY MATERIALS

	Standard No. 1	Standard No. 2	Standard All No. 2	Too Soils 60 lb Under
RAILS				
Bessemer,Pa. U5	4.725	4.625	4.675	5.65
Ensley,Ala. T2	4.725	4.625	....	5.65
Fairfield,Ala. T2	....	....	....	5.65
Gary,Ind. U5	4.725	4.625	4.675	...
Huntington,W.Va. W7	....	....	....	6.15
IndianaHarbor,Ind. I-2	4.725	4.625	4.675	...
Johnstown,Pa. B2	....	....	...(16)	5.65
Lackawanna,N.Y. B2	4.725	4.625	...(16)	5.65
Minnequa,Colo. C10	4.725	4.625	....	6.15
Steelton,Pa. B2	4.725	4.625	....	...
Williamsport,Pa. S19	....	....	....	*6.15*

TIE PLATES

Fairfield,Ala. T2	5.625
Gary,Ind. U5	5.625
Ind.Harbor,Ind. I-2	5.625
Lackawanna,N.Y. B2	5.625
Minnequa,Colo. C10	5.625
Seattle B3	5.775
Steelton,Pa. B2	5.625
Torrance,Calif. C11	5.775

TRACK BOLTS, Untreated

Cleveland R2	12.15
KansasCity,Mo. S5	12.90*
Lebanon,Pa. B2	12.15
Minnequa,Colo. C10	12.15
Pittsburgh O3, P14	12.15
Seattle B3	12.65

*Treated

AXLES

Ind.Harbor,Ind. S13	7.50
Johnstown,Pa. B2	7.50

JOINT BARS

Bessemer,Pa. U5	5.825
Fairfield,Ala. T2	5.825
Ind.Harbor,Ind. I-2	5.825
Joliet,Ill. U5	5.825
Lackawanna,N.Y. B2	5.825
Minnequa,Colo. C10	5.825
Steelton,Pa. B2	5.825

SCREW SPIKES

Cleveland R2	11.90
Pittsburgh O3	11.90

STANDARD TRACK SPIKES

Fairfield,Ala. T2	8.05
Ind.Harbor,Ind. I-2, Y1	8.05
KansasCity,Mo. S5	7.90
Lebanon,Pa. B2	8.05
Minnequa,Colo. C10	7.90
Pittsburgh J5	8.05
Seattle B3	8.55
S.Chicago,Ill. R2	8.05
Struthers,O. Y1	8.05
Youngstown R2	8.05

Footnotes

(1) Chicago base.
(2) Angles, flats, bands.
(3) Merchant.
(4) Reinforcing.
(5) 1¼-in. to less than 1 7/16-in.
(6) Chicago or Birm. base.
(7) To jobbers, 3 cols. lower.
(8) 14 Ga. and heavier.
(9) Merchant quality; add 0.35c for special quality.
(10) Pittsburgh base.
(11) Cleveland & Pitts. base.
(12) Worcester, Mass., base.
(13) Add 0.25c for 17 Ga. & heavier.
(14) Gage 0.143 to 0.249 in.; for gage 0.142 and lighter, 5.80c.
(15) ⅜" and thinner.
(16) 40 lb and under.
(17) Flats only; 0.25 in. & heavier.
(18) To dealers.
(19) Chicago & Pitts. base.
(20) Plus 1c per 100 lb.
(21) New Haven, Conn., base.
(22) Deld. San Francisco Bay area.
(24) Deduct 0.10c, finer than 15 Ga.
(25) Bar mill bands.
(26) Delivered in mill zone, 5.25c.
(27) Bar mill sizes.
(28) Bonderized.
(29) Youngstown base.
(30) Sheared; for universal mill add 0.45c.
(31) Widths over ⅝ in.; 6.90c for widths ⅝-in. and under by 0.125 in. and thinner.
(32) Buffalo base.
(33) To jobbers, deduct 25c.
(34) 9.60c for cut lengths.
(35) 72" and narrower.
(36) 54" and narrower.
(37) 13 Ga. & heavier; 60" & narrower.
(38) 14 Ga. & Lighter; 49" & narrower.
(39) 48" and narrower.
(40) Lighter than 0.035"; 0.035" and heavier, 0.25c higher.
(41) 9.10c for cut lengths.
(42) Mill lengths, f.o.b. mill; deld. in mill zone or within switching limits, 5.25c.
(43) 9-14½ Ga.
(48) 6-7 Ga.
(49) 3½-in. and smaller rounds; 7.95c over 3½ in. and other shapes.

SEAMLESS STANDARD PIPE, Threaded and Coupled

Carload discounts from list, %

Size—Inches	3		3½		4		5		6	
List Per Ft	37c		58.5c		76.5c	92c	$1.09	$1.48	$1.92	
Pounds Per Ft	3.66		5.82		7.62	9.20	10.89	14.81	19.18	
	Blk	Galv*	Blk	Galv*	Blk	Galv*	Blk	Galv*	Blk	Galv*	Blk	Galv*
Aliquippa, Pa. J5	4	+14	10.5	+8.25	13	+5.75	14.5	+4.25	14.5	+4.25	14	+4.75	16.5	+2.25
Ambridge, Pa. N2	4	....	10.5	....	13	....	14.5	....	14.5	....	14	....	16.5	....
Lorain, O. N3	4	+14	10.5	+8.25	13	+5.75	14.5	+4.25	14.5	+4.25	14	+4.75	16.5	+2.25
Youngstown Y1	6.5	+11.5	10.5	+8.25	13	+5.75	14.5	+4.25	14.5	+4.25	14	+4.75	16.5	+2.25

ELECTRIC WELD STANDARD PIPE, Threaded and Coupled

Carload discounts from list, %

Youngstown R2	6.5	+11.5	10.5	+8.25	13	+5.75	14.5	+4.25	14.5	+4.25	14	+4.75	16.5	+2.25

BUTTWELD STANDARD PIPE, Threaded and Coupled

Carload discounts from list, %

Sizes—Inches	¼		⅜		½		⅝		¾		1		1¼	
List Per Ft	5.5c		6c		8c		8.5c		11.5c		17c		23c	
Pounds Per Ft	0.24		0.42		0.57		0.85		1.13		1.68		2.28	
	Blk	Galv*	Blk	Galv*	Blk	Galv*	Blk	Galv*	Blk	Galv*	Blk	Galv*	Blk	Galv*
Aliquippa, Pa. J5	....	....	....	....	....	....	18.5	+0.75	21.5	3.25	24	6.75	26.5	8.5
Alton, Ill. L1	....	....	....	....	....	....	16.5	+2.75	19.5	1.25	22	4.75	24.5	6.5
Benwood, W. Va. W10	17.5	+13	9	+18.5	+0.75	+26.5	18.5	+0.75	21.5	3.25	24	6.75	26.5	8.5
Butler, Pa. P6	18	+12.5	9.5	+18	1.5	+26	....	....	....	....	....	....	....	....
Etna, Pa. N2	....	....	....	....	....	....	18.5	+0.75	21.5	3.25	24	6.75	26.5	8.5
Fairless, Pa. N3	....	....	....	....	....	....	16.5	+2.75	19.5	1.25	22	4.75	24.5	6.5
Fontana, Calif. K1	....	....	....	....	....	....	6	+13.25	9	+9.25	11.5	+5.75	14	+4
Ind. Harbor, Ind. Y1	....	....	....	....	....	....	17.5	+1.75	20.5	2.25	23	5.75	25.5	7.5
Lorain, O. N3	....	....	....	....	....	....	18.5	+0.75	21.5	3.25	24	6.75	26.5	8.5
Sharon, Pa. S4	18	+12.5	9.5	+18	1.5	+26	....	....	....	....	....	....	....	....
Sharon, Pa. M6	....	....	....	....	....	....	18.5	+0.75	21.5	3.25	24	6.75	26.5	8.5
Sparrows Pt., Md. B2	16	+12.5	7.5	+18	+0.5	+25	16.5	+0.75	19.5	3.25	22	6.75	24.5	8
Youngstown R2, Y1	....	....	....	....	....	....	18.5	+0.75	21.5	3.25	24	6.75	26.5	8.5
Wheatland, Pa. W9	18	+12.5	9.5	+18	1.5	+26	18.5	+0.75	21.5	3.25	24	6.75	26.5	8.5

Size—Inches	1½		2		2½		3		3½		4	
List Per Ft	27.5c		37c		58.5c		76.5c		92c		$1.09	
Pounds Per Ft	2.73		3.68		5.82		7.62		9.20		10.89	
	Blk	Galv*	Blk	Galv*	Blk	Galv*	Blk	Galv*	Blk	Galv*	Blk	Galv*
Aliquippa, Pa. J5	27	9.5	27.5	10	29	10.75	29	10.75	....	....	....	....
Alton, Ill. L1	25	7.5	25.5	8	27	8.75	27	8.75	....	....	....	....
Benwood, W. Va. W10	27	9.5	27.5	10	29	10.75	29	10.75	19.5	0.75	19.5	0.75
Etna, Pa. N2	27	9.5	27.5	10	29	10.75	29	10.75	19.5	0.75	19.5	0.75
Fairless, Pa. N3	25	7.5	25.5	8	27	8.75	27	8.75	17.5	+1.25	17.5	+1.25
Fontana, Calif. K1	14.5	+3	15	+2.5	16.5	+1.75	16.5	+1.75	7	+11.75	7	+11.75
Ind. Harbor, Ind. Y1	26	8.5	26.5	9	28	9.75	28	9.75	18.5	+0.25	18.5	+0.25
Lorain, O. N3	27	9.5	27.5	10	29	10.75	29	10.75	....	....	....	....
Sharon, Pa. M6	27	9.5	27.5	10	29	10.75	29	10.75	....	....	....	....
Sparrows Pt., Md. B2	25	9	25.5	9.5	27	9.75	27	9.75	17.5	+0.25	17.5	+0.25
Wheatland, Pa. W9	27	9.5	27.5	10	29	10.75	29	10.75	19.5	0.75	19.5	0.75
Youngstown R2, Y1	27	9.5	27.5	10	29	10.75	29	10.75	19.5	0.75	19.5	0.75

*Galvanized pipe discounts based on current price of zinc (13.50c, East St. Louis).

Stainless Steel

Representative prices, cents per pound; subject to current lists of extras

AISI Type	Rerolling: Ingot	Rerolling: Slabs	Forging: Billets	Seamless Tube: Billets	H.R. Strip	Wire Rods; C.F. Wire	Bars; Structural Shapes	Plates	Sheets	C.R. Strip; Flat Wire
201	18.50	23.00	....	....	31.00	....	....	....	42.25	39.00
202	19.75	25.50	31.00	36.25	33.50	....	36.75	38.75	42.50	42.50
301	19.25	23.75	....	36.75	32.00	36.00	35.00	....	44.25	41.00
302	20.50	26.25	32.00	37.25	34.50	36.25	38.25	40.25	44.50	44.50
302B	20.25	26.50	33.00	37.25	37.75	36.25	38.25	40.25	47.00	47.00
303	....	26.75	34.75	40.00	....	39.00	41.00	....	....	....
304	21.75	27.50	33.75	39.00	37.25	38.25	40.25	43.00	47.25	47.25
304L	....	....	40.25	....	43.75	45.25	47.25	50.00	54.25	54.25
305	23.25	30.50	....	39.50	40.25	38.25	40.25	43.50	50.25	50.25
308	25.00	32.00	40.00	....	42.75	45.25	47.50	51.75	54.00	54.00
309	32.50	41.25	48.25	....	55.00	54.00	56.75	60.25	69.00	69.00
310	39.75	50.50	64.75	....	71.00	72.25	74.50	78.25	81.75	81.75
314	....	....	....	....	....	72.75	....	78.25	....	....
316	33.00	41.75	52.75	....	59.75	59.75	62.75	66.00	70.25	70.25
316L	....	....	58.75	....	65.75	66.75	69.75	73.00	77.25	77.25
317	40.25	51.25	65.75	....	76.50	74.75	78.50	81.00	87.75	87.75
321	26.50	33.50	39.75	....	45.75	45.00	47.25	51.25	56.25	56.25
18-8CbTa	30.75	39.50	47.25	....	54.75	52.75	55.50	60.00	68.50	68.50
403	....	....	28.75	32.75	....	32.25	34.00	36.25	....	....
405	17.50	23.00	26.75	31.00	32.25	30.50	32.00	33.75	42.25	42.25
410	15.00	19.50	25.50	29.50	28.00	29.00	30.50	31.75	36.25	36.25
416	....	....	26.00	30.00	....	29.50	31.00	....	....	....
420	....	30.25	31.00	36.00	37.75	35.50	37.25	40.75	56.00	56.00
430	15.25	19.75	26.00	30.00	28.75	29.50	31.00	32.25	36.75	36.75
430F	....	....	26.50	30.50	....	30.00	31.50	....	....	....
431	....	25.50	33.25	....	....	37.25	39.25	40.75	....	....
446	....	....	35.50	40.50	53.25	40.00	42.00	43.25	63.25	63.25

Stainless Steel Producers Are: Allegheny Ludlum Steel Corp.; Alloy Metal Wire Co. Inc.; Alloy Tube Div., Carpenter Steel Co.; American Steel & Wire Div., U. S. Steel Corp.; Armco Steel Corp.; Babcock & Wilcox Co.; Bethlehem Steel Co.; J. Bishop & Co.; G. O. Carlson Inc.; Carpenter Steel Co.; Charter Wire Products Co.; Cold Metal Products Co.; Crucible Steel Co. of America; Damascus Tube Co.; Wilbur B. Driver Co.; Driver-Harris Co.; Eastern Stainless Steel Corp.; Elwood Ivins Steel Tube Works Inc.; Firth Sterling Inc.; Ft. Wayne Metals Inc.; Globe Steel Tubes Co.; Helical Tube Co.; Indiana Steel & Wire Co.; Ingersoll Steel Div., Borg-Warner Corp.; Jessop Steel Co.; Johnson Steel & Wire Co. Inc.; Joslyn Mfg. & Supply Co.; Kenmore Metals Corp.; Maryland Fine & Specialty Wire Co.; McLouth Steel Corp.; Metal Forming Corp.; McInnes Steel Co.; National-Standard Co.; National Tube Div., U. S. Steel Corp.; Newman-Crosby Steel Co.; Pacific Tube Co.; Page Steel & Wire Div., American Chain & Cable Co. Inc.; Pittsburgh Rolling Mills Inc.; Republic Steel Corp.; Rodney Metals Inc.; Rome Mfg. Co.; Rotary Electric Steel Co.; Sharon Steel Corp.; Sawhill Tubular Products Inc.; Simonds Saw & Steel Co.; Specialty Wire Co. Inc.; Spencer Wire Corp.; Stainless Welded Products Inc.; Standard Tube Co.; Superior Steel Corp.; Superior Tube Co.; Techalloy Co. Inc.; Timken Roller Bearing Co.; Trent Tube Co.; Tube Methods Inc.; Ulbrich Stainless Steels; United States Steel Corp.; Universal-Cyclops Steel Co.; Wallingford Steel Co., Washington Steel Corp.

Clad Steel

	Plates: Carbon Base: 10%	Plates: Carbon Base: 20%	Sheets: Carbon Base: 20%
302	....	....	30.50
304	31.55	37.95	32.50
304-L	34.10	40.90	....
316	36.50	42.75	47.00
316-L	42.30	50.10	....
316-CB	42.50	50.50	....
321	33.25	39.65	37.25
347	36.20	44.25	48.25
405	26.35	33.85	....
410	28.85	33.35	....
430	28.85	33.35	....
Inconel	50.00	65.95	....
Nickel	41.80	56.15	....
Nickel, Low Carbon	43.50	60.55	....
Monel	44.50	60.50	....
Copper*	....	....	46.00

	Strip, Carbon Base, Cold Rolled: 10%	Strip, Carbon Base, Cold Rolled: Both Sides
Copper*	33.40	42.15

*Deoxidized. Production points: Stainless-clad sheets, New Castle, Ind. I-4; stainless-clad plates, Claymont, Del. C22, Coatesville, Pa. L7, New Castle, Ind. I-4 and Washington, Pa. J3; nickel, inconel, monel-clad plates, Coatesville L7; copper-clad strip, Carnegie, Pa. S18.

Tool Steel

Grade	$ per lb	Grade	$ per lb
Regular Carbon	0.275	5% Cr Hot Work	0.430-0.460
Extra Carbon	0.330	W-Cr Hot Work	0.450
Special Carbon	0.390	V-Cr Hot Work	0.470
Oil Hardening	0.430	Hi-Carbon-Cr	0.770

Grade by Analysis (%)

W	Cr	V	Co	Mo	$ per lb
20.25	4.25	1.6	12.25	....	4.900
18.25	4.25	1	4.75	....	2.305-2.475
18	4	2	9	....	2.675-2.6775
18	4	2	....	....	1.765
18	4	1	....	....	1.660
13.75	3.75	2	5	....	2.345
13.5	4	3	....	....	1.865
9	3.5	....	....	....	1.180
6	4	2	....	5	1.105
6	4	3	....	6	1.350
1.5	4	1	....	8.5	0.960

Tool steel producers include: A4, A8, B2, B8, C4, C9, C13, C18, D4, F2, J3, M14, S8, U4, V2 and V3.

Pig Iron

F.o.b. furnace prices in dollars per gross ton, as reported to STEEL. Minimum delivered prices are approximate and do not include 2% federal tax.

Birmingham District	Basic	No. 2 Foundry	Malleable	Bessemer
AlabamaCity,Ala. R2	54.50	....	....	....
Birmingham R3	54.50	55.00‡	....	....
Birmingham U6	....	59.00†	63.00	....
Woodward,Ala. W15	58.50	59.00‡	63.00	....
Cincinnati, deld.	....	66.70	....	....
Buffalo District				
Buffalo H1, R2	60.00	60.50	61.00	61.50
Tonawanda,N.Y. W12	60.00	60.50	61.00	61.50
N.Tonawanda,N.Y. T9	....	*63.00*	*63.50*	*64.00*
Boston, deld.	70.65	71.15	71.65	....
Rochester,N.Y., deld.	63.92	63.52	64.02	....
Syracuse,N.Y., deld.	64.12	64.62	65.12	....
Chicago District				
Chicago I-3	*62.50*	*63.00*	*63.00*	*63.50*
Gary,Ind. U5	60.00	....	60.50	....
S.Chicago,Ill. R2	60.00	....	60.50	....
S.Chicago,Ill. Y1	60.00	60.50	60.50	61.00
S.Chicago U5	*60.00*	....	*60.50*	*61.00*
S.Chicago,Ill. W14	*62.50*	....	*63.00*	*63.50*
Milwaukee, deld.	*64.80*	*65.30*	*65.30*	*65.80*
Muskegon,Mich., deld.	....	*69.68*	*69.68*	....
Cleveland District				
Cleveland R2, A7	60.00	60.50	60.50	61.00
Akron,O., deld.	62.75	63.25	63.25	63.75
Mid-Atlantic District				
Bethlehem,Pa. B2	62.00	62.50	63.00	63.50
New York, deld.	....	66.51	67.01	....
Newark, deld.	65.20	65.70	66.20	66.70
Birdsboro,Pa. B10	*64.50*	*65.00*	*66.50*	*66.00*
Chester,Pa. P14	62.00	62.50	63.00	....
Philadelphia, deld.	63.76	64.26	64.76	....
Steelton,Pa. B2	62.00	62.50	63.00	63.50
Swedeland,Pa. A3	64.50	65.00	65.50	66.00
Philadelphia, deld.	66.26	66.76	67.26	67.76
Troy N.Y. R2	62.00	62.50	63.00	63.50
Pittsburgh District				
Neville Island,Pa. P8	62.50	63.00	63.00	63.50
Pittsburgh (N&S sides), Aliquippa, deld.	....	64.45	64.45	64.95
McKeesRocks, deld.	....	64.10	64.10	64.63
Lawrenceville, Homestead, Wilmerding,Monaca, deld.	....	64.76	64.76	65.29
Verona,Trafford, deld.	64.79	65.32	65.32	65.85
Brackenridge, deld.	65.10	65.60	65.60	66.13
Bessemer,Pa. U5	60.00	....	60.50	61.00
Clairton,Rankin,S.Duquesne,Pa. U5	60.00	....	....	....
Midland,Pa. C18	60.00	....	....	....

Youngstown District	Basic	No. 2 Foundry	Malleable	Bessemer
Hubbard,O. Y1	....	....	60.50	....
Sharpsville,Pa. S6	60.00	....	60.50	61.00
Youngstown Y1	....	....	60.50	61.00
Mansfield,O., deld.	64.90	....	65.40	65.90
Duluth I-3	*62.50*	*63.00*	*63.00*	*63.50*
Erie,Pa. I-3	*62.50*	*63.00*	*63.00*	*63.50*
Everett,Mass. E1	63.25	63.75	64.25	....
Fontana,Calif. K1	70.00	70.50	....	....
Geneva,Utah C11	60.00	60.50	....	....
GraniteCity,Ill. G4	61.90	62.40	62.90	....
Ironton,Utah C11	60.00	60.50	....	....
LoneStar,Texas L6	....	55.00*	....	....
Minnequa,Colo. C10	62.00	62.50	63.00	....
Rockwood,Tenn. T3	....	55.00‡	59.00	....
Toledo,O. I-3	*62.50*	*63.00*	*63.00*	*63.50*
Cincinnati, deld.	*68.26*	*68.76*	....	....

*Phos. 0.51-0.75%; $56, Phos. 0.31-0.50%.
†Phos. 0.70-0.90; intermediate (Phos. 0.31-0.70%), $60
‡Phos. 0.70-0.90; intermediate (Phos. 0.31-0.69%), $56

PIG IRON DIFFERENTIALS

Silicon: Add 50 cents per ton for each 0.25% Si or percentage thereof over base grade, 1.75-2.25%, except on low phos iron on which base is 1.75-2.00%.

Manganese: Add 50 cents per ton for each 0.50% manganese over 1% or portion thereof.

Nickel: Under 0.05% no extra; 0.50-0.74%, inclusive, add $2 per ton and each additional 0.25%, add $1 per ton.

BLAST FURNACE SILVERY PIG IRON, Gross Ton

(Base 6.00-6.50% silicon; add $1.25 for each 0.5% Si; 75 cents for each 0.50% Mn over 1%)

Jackson,O. G2, J1	69.00
Buffalo H1	70.25

ELECTRIC FURNACE SILVERY IRON, Gross Ton

(Base 14.01-14.50% silicon; add $1 for each 0.5% Si to 18%; $1 for each 0.50% Mn over 1%; $2 per gross ton premium for 0.045% max P)

NiagaraFalls,N.Y. P15	$92.50
Keokuk,Iowa, Open-hearth & Fdry, (freight allowed K2)	97.00
Keokuk, O. H. & Fdry, 12½ lb piglets, 16% Si, frgt allowed K2	100.00

LOW PHOSPHORUS PIG IRON, Gross Ton

Lyles,Tenn. T3 (Phos. 0.035% max)	$72.50
Rockwood,Tenn. T3 (Phos. 0.035% max)	72.50
Steelton,Pa. B2 (Phos. 0.035% max)	68.00
Philadelphia, deld.	71.55
Troy,N.Y. R2 (Phos. 0.035% max)	68.00
Cleveland A7 (Intermediate) (Phos. 0.036-0.075% max)	65.00
Duluth I-3 (Intermediate) (Phos. 0.016-0.075% max)	*67.50*
Erie,Pa. I-3 (Intermediate) (Phos. 0.016-0.075% max)	*67.50*
Neville Island,Pa. P6 (Intermediate) (Phos. 0.036-0.075% max)	67.50

Warehouse Steel Products

Representative prices, per pound, subject to extras, f.o.b. warehouse. City delivery charges are 15 cents per 100 lb except: St. Paul, 25 cents; Moline, Norfolk, Richmond, Washington, 20 cents; Baltimore, Boston, Los Angeles, New York, Philadelphia, Portland, San Francisco, Spokane, 10 cents; Atlanta, Houston, Seattle, no charge.

	SHEETS				STRIP	BARS				Standard Structural Shapes	PLATES	
	Hot-Rolled	Cold-Rolled	Gal. 10 Ga.†	Stainless Type 302	Hot-Rolled*	H.R. Merchant Qual.	H.R. Spec. Qual.	C.F. Rds.§	H.R. Alloy 4140††		Carbon	Floor
Atlanta	7.14	8.20	8.87	....	7.40	7.42	...	9.39	....	7.62	7.49	9.48
Baltimore	7.74	8.60	9.00	....	8.20	8.20	8.73	8.99¶	14.89	8.44	8.06	9.62
Birmingham	7.63‡	8.50‡	8.85‡	....	7.71	7.77	8.95	...	....	7.93	7.85	10.00
Boston	8.62	9.32	10.82	57.24	8.71	8.71	9.26	10.36	14.16	8.77	8.91	10.34
Buffalo	7.70	8.50	10.51	....	7.85	7.85	8.55	8.40	14.00	8.10	8.30	9.50
Chattanooga	7.78‡	8.69‡	8.60‡	....	7.88	7.92	8.45	...	....	8.13	8.10	9.82
Chicago	7.63	8.49	9.60	....	7.71	7.77	8.30	8.25	13.65	7.93	7.95	9.23
Cincinnati	7.75	8.45	9.60	....	7.95	8.01	8.54	8.65	13.90	8.40	8.24	9.47
Cleveland	7.63	8.49	9.45	....	7.81	7.83	8.36	8.50	13.71	8.26	8.12	9.39
Denver	8.95	10.31	11.72	....	9.10	9.10	...	9.82	17.87	8.95	9.10	10.50
Detroit	7.82	8.68	9.88	....	7.99	8.05	8.58	8.54	13.89	8.40	8.23	9.41
Erie, Pa.	7.08	8.24	8.95¹⁰	....	7.31	7.35	...	8.10¹⁰	....	7.65	7.30	8.79
Houston	7.85	8.75	10.49	....	8.15	8.25	...	9.95	14.00	8.20	8.00	9.20
Jackson, Miss.	7.96‡	8.77‡	9.22‡	....	7.94	8.09	8.62	...	....	8.25	8.27	9.94
Los Angeles	8.15	10.00	11.00	51.50	8.50	8.15	8.70	10.90	14.40	8.30	8.75	10.55
Milwaukee	7.72	8.58	9.69	....	7.80	8.86	8.39	8.44	13.74	8.10	8.04	9.31
Moline, Ill.	7.49	8.50	9.45	....	7.56	7.62	...	8.10	....	7.78	7.80	...
New York	8.28	9.13	10.13	56.13	8.73	8.66	9.21	10.27	14.97	8.41	8.71	10.09
Norfolk, Va.	7.35	...	...	....	7.50	7.85	...	9.95	....	8.10	7.60	9.10
Philadelphia	7.84	8.69	9.91	....	8.49	8.23	8.76	9.02	13.85	8.25	8.22	9.33
Pittsburgh	7.63	8.74	9.90	52.00	7.81	7.77	8.30	8.50	13.65	7.93	7.95	9.22
Portland, Oreg.	8.30	8.80	10.80	....	8.55	8.25	...	12.55	15.30	8.20	8.20	10.10
Richmond, Va.	7.85	...	9.90	....	8.45	8.45	8.80	10.00	....	8.70	8.15	9.85
St. Louis	7.92	8.78	9.89	....	8.00	8.06	8.59	8.79	13.94	8.33	8.24	9.51
St. Paul	7.83	8.78	9.80	....	7.91	7.97	...	8.70	....	8.13	8.15	9.42
San Francisco	8.20	9.65	10.15	51.65	8.35	8.15	8.70	11.45	14.40⁹	8.25	8.30	10.50
Seattle	8.75	10.50	10.90	49.80	8.90	8.60	9.15	12.25	14.75	8.50	8.50	10.70
Spokane, Wash.	9.25	11.60	11.40	....	9.40	9.10	9.65	12.75	15.90	9.00	9.00	11.70
Washington	8.31	10.43	...	....	8.99	8.74	...	9.90	....	9.02	8.64	11.10

*Prices do not include gage extras; †prices include gage and coating extras (based on 12.50c zinc at Los Angeles and 13.50c at other points), except in Birmingham (coating extra excluded); ‡includes 35-cent bar quality extras; **⅜-in. and heavier; ††as annealed; §42 in. and under.

Base quantities, 2000 to 4999 lb except as noted; Cold-rolled strip and cold-finished bars, 2000 lb and over except in Seattle, 2000 to 9999 lb, and in Los Angeles, 6000 lb and over; stainless sheets, 3000 lb except in Chicago, New York and Boston, 10,000 lb and in San Francisco, 2000 to 4999 lb; hot-rolled products on West Coast, 2000 to 9999 lb; ⁸—400 to 999 lb; ⁹—2000 to 3999 lb; ¹⁰—2000 lb and over.

Refractories

Fire Clay Brick (per 1000)

High-Heat Duty: Ashland, Grahn, Hayward, Hitchins, Haldeman, Olive Hill, Ky., Athens, Troup, Tex., Beech Creek, Clearfield, Curwensville, Lock Haven, Lumber, Orviston, West Decatur, Pa., Bessemer, Ala., Farber, Mexico, St. Louis, Vandalia, Mo., Ironton, Oak Hill, Parral, Portsmouth, O., Ottawa, Ill., Stevens Pottery, Ga., $128; Salina, Pa., $133; Niles, O., $138; Cutler, Utah, $148.

Super-Duty: Ironton, O., Vandalia, Mo., Olive Hill, Ky., Clearfield, Pa., New Savage, Md., St. Louis, $165.

Silica Brick (per 1000)

Standard: Alexandria, Claysburg, Mt. Union, Sproul, Pa., Ensley, Ala., Windham, Portsmouth, O., Hawstone, Pa., $140; Warren, Niles, O., Hays, Pa., $145; Morrisville, Pa., $145; E. Chicago, Ind., Joliet, Rockdale, Ill., $150; Lehigh, Utah, $165; Los Angeles, $170.

Super-Duty: Hays, Sproul, Hawstone, Pa., Niles, Warren, Windham, O., Leslie, Md., Athens, Tex., $145; Morrisville, Pa., $148; Joliet, Ill., $151; Curtner, Calif., $182.

Semisilica Brick (per 1000)

Clearfield, Pa., $145; Philadelphia, $124; Woodbridge, N. J., $122.

Ladle Brick (per 1000)

Dry Pressed: Alsey, Ill., Chester, New Cumberland, W. Va., Freeport, Johnstown, Merrill Station, Pa., Mexico, Vandalia, Mo., $93; Wellsville, O., $92.50; Clearfield, Pa., Portsmouth, O., $98.

High-Alumina Brick (per 1000)

50 Per Cent: St. Louis, Mexico, Vandalia, Mo., $220; Danville, Ill., $197; Philadelphia, Clearfield, Pa. $201.

60 Per Cent: St. Louis, Mexico, Vandalia, Mo., $275; Danville, Ill., $244; Philadelphia, Clearfield, Pa., $248.

70 Per Cent: St. Louis, Mexico, Vandalia, Mo., $315; Danville, Ill., $281; Philadelphia, Clearfield, Pa., $325.

Sleeves (per 1000)

Reesdale, Johnstown, Bridgeburg, Pa., $177; Clearfield, Pa., $158.50; St. Louis, $169.30.

Nozzles (per 1000)

Reesdale, Pa., $253.70; Johnstown, Pa., $259.20; Clearfield, Pa., $259.40; St. Louis $259.45; Bridgeburg, Pa. $292.

Runners (per 1000)

Reesdale, Johnstown, Bridgeburg, Pa., $221; Clearfield, Pa., $198; St. Louis, $195.80.

Dolomite (per net ton)

Domestic, dead-burned, bulk, Billmeyer, Blue Bell, Williams, Plymouth Meeting, York, Pa., Millville, W. Va., Bettsville, Millersville, Martin, Woodville, O., Gibsonburg, Narlo, O., $15; Thornton, McCook, Ill., $15.60; Dolly Siding, Bonne Terre, Mo., $14.

Magnesite (per net ton)

Domestic, dead-burned, bulk ½-in. grains with fines: Chewelah, Wash., $43; Luning, Nev., $43. ⅝-in. grains with fines: Baltimore, $66.40.

Fluorspar

Metallurgical grades, f.o.b. shipping point, in Ill., Ky., net tons, carloads, effective CaF_2 content 72.5%, $38-39; 70%, $35-36; 60%, $31-32. Imported, net tons, f.o.b. cars point of entry, duty paid, metallurgical grade: European, $34; Mexican, $26.50.

Ores

Lake Superior Iron Ore

(Prices effective for the 1956 shipping season, gross tons, 51.50% iron natural, rail of vessel, lower lake ports.)

Old range bessemer	$11.25
Old range nonbessemer	11.10
Mesabi bessemer	11.00
Mesabi nonbessemer	10.85
Open-hearth lump	12.10
High phos.	10.85

The foregoing prices are based on upper lake rail freight rates, lake vessel freight rates, handling and unloading charges, and taxes thereon, which were in effect Dec. 1, 1955, and increases or decreases after such date are for seller's account.

Eastern Local Iron Ore

Cents per unit, deld. E. Pa.

Foundry and basic 52-62% concentrates contract	17.00-18.00

Foreign Iron Ore

Cents per unit, c.i.f. Atlantic ports

Swedish basic, 65%	25.00
N. African hematite (spot)	nom. 24.00-25.00
Brazilian iron ore, 68-69%	33.00

Tungsten Ore

Net ton unit, before duty

Foreign, wolframite, good commercial quality	$32.50133.00
Domestic, scheelite, mine	63.00

Manganese Ore

Mn 48%, delivery within six months, $1.35-$1.40 nom., per long ton unit, c.i.f. U. S. ports, duty for buyer's account; 46-47%, $1.10-$1.15 nom

Chrome Ore

Gross ton, f.o.b. cars New York, Philadelphia, Baltimore, Charleston, S. C., plus ocean freight differential for delivery to Portland, Oreg., Tacoma, Wash.

Indian and African

48% 3:1	$52.00-$53.50
48% 2.8:1	nom. 49.00-50.00
48% no ratio	39.00-40.00

South African Transvaal

48% no ratio	$35.00-$36.00
44% no ratio	25.00-26.00

Domestic

Rail nearest seller

18% 3:1	$39.00

Molybdenum

Sulphide concentrate, per lb of Mo content, mines, unpacked $1.10

Antimony Ore

Per unit of 8lb content, c.i.f. seaboard

55-60%	$3.35-$3.80
60-65%	3.80-3.90

Vanadium Ore

Cents per lb V_2O_5

Domestic	31.00

Metal Powder

(Per pound f.o.b. shipping point in ton lots for minus 100 mesh, except as noted)

	Cents
Sponge iron:	
Swedish, c.l.f., Camden, N.J., c.l. in bags	8.50
Domestic:	
F.o.b., Johnstown, Pa., Niagara Falls, N. Y., in bags	9.50
F.o.b. Riverton, N. J., in bags	8.50
Canadian, f.o.b. shipping point	9.50
Electrolytic iron:	
Melting stock, 99.9% Fe, irregular fragments of ⅛ in. x 1.3 in.	22.00
Annealed, 99.5% Fe.	36.50
Unannealed (99+% Fe)	34.00
Unannealed (99+% Fe) (minus 325 mesh)	57.00
Powder Flakes (minus 16, plus 100 mesh)	31.00
Carbonyl Iron:	
98.1-99.9%, 3 to 20 microns, depending on grade, 86.00-275.00, in standard 200-lb containers; all minus 200 mesh.	
Aluminum:	
Atomized, 500 lb, drum frght. allowed	
Carlots	*16.20*
Ton lots	*18.20*
Antimony, 500 lb lots	32.00*
Brass, 5000-lb lots	*39.75-51.00†*
Bronze, 5000-lb lots	*61.25-65.00†*
Copper:	
Electrolytic	14.25*
Reduced	14.25*
Lead	7.50*
Manganese:	
Minus 35 mesh	64.00
Minus 100 mesh	70.00
Minus 200 mesh	75.00
Nickel,unannealed	$1.00
Nickel-Silver, 5000-lb lots	*59.25-62.25†*
Phosphor-Copper, 5000-lb lots	*67.00*
Silicon	47.50
Solder	7.00*
Stainless Steel, 302	99.00
Stainless Steel, 316	$1.32
Tin	14.50*
Zinc 5000-lb lots	*19.75-33.00‡*

Tungsten:	Dollars
Melting grade, 99%	
50 to 200 mesh:	
1000 lb and over	4.50
Less than 1000 lb	4.65
Chromium, electrolytic 99.8% Cr min. metallic basis	5.00

*Plus cost of metal. †Depending on composition. ‡Depending on mesh. §70% Cu, 20% Zn, 10% Ni. **64% Cu, 18% Zn, 18% Ni.

Electrodes

Threaded with nipple; unboxed, f.o.b. plant

GRAPHITE

Inches		Per
Diam	Length	100 lb
2	24	$52.50
2½	30	33.75
3	40	32.00
4	40	30.25
5¼	40	30.00
6	60	27.25
7	60	26.75
8, 9, 10	60	24.25
12	72	27.25
14	60	23.50
16	72	22.50
17	60	23.00
18	72	22.50
20	72	22.25

CARBON

8	60	12.10
10	60	11.80
12	60	11.75
14	60	11.70
14	72	10.85
17	60	10.75
17	72	10.35
20	84	10.30
20	90	10.10
24	72, 84	10.30
24	96	10.05
30	84	10.20
40, 35	110	9.90
40	100	9.90

Metallurgical Coke

Price per net ton

Beehive Ovens

Connellsville, furnace	$13.75-14.50
Connellsville, foundry	16.00-17.00

Oven Foundry Coke

Birmingham, ovens	$25.65
Cincinnati, deld.	30.58
Buffalo, ovens	27.50
Camden, N. J., ovens	26.50
Detroit, ovens	27.50
Pontiac, deld.	29.15
Saginaw, deld.	30.73
Erie, Pa., ovens	27.50
Everett, Mass., ovens	
New England, deld.	*28.55
Indianapolis, ovens	26.75
Ironton, O., ovens	26.00
Cincinnati, deld.	28.59
Kearny, N. J., ovens	26.75
Lone Star, Tex., ovens	19.50
Milwaukee, ovens	27.50
Neville Island (Pittsburgh), Pa., ovens	26.25
Painesville, O., ovens	27.50
Cleveland, deld.	29.43
Philadelphia, ovens	26.50
St. Louis, ovens	28.50
St. Paul, ovens	26.50
Chicago, deld.	29.82
Swedeland, Pa., ovens	26.50
Terre Haute, Ind., ovens	26.75

*Or within $4.55 freight zone from works.

Imported Steel

(Base per 100 lb, landed, duty paid. Source of shipment: Western continental European countries)

	North Atlantic	South Atlantic	Gulf Coast	West Coast
Deformed Bars, Intermediate, ASTM-A-305	*$7.05*	*$7.05*	*$7.05*	*$7.45*
Bar Size Angles	*6.90*	*6.90*	*6.90*	*7.30*
Structural Angles	*7.45*	*7.45*	*7.45*	*7.85*
I-Beams	*7.65*	*7.65*	*7.65*	*8.05*
Plates	*8.90*	*8.90*	*8.90*	*9.30*
Sheets, H.R.	8.75	8.75	8.75	9.15
Sheets, C.R. (drawing quality)	9.10	9.10	9.10	9.45
Furring Channels, C.R., 1000 ft, ⅞ x 0.30 lb per ft	26.50	26.50	26.50	26.46
Barbed Wire (†)	6.50	6.50	6.50	6.85
Merchant Bars	*7.00*	*7.00*	*7.00*	*7.40*
Hot-Rolled Bands	*7.50*	*7.50*	*7.50*	*7.90*
Wire Rods, Thomas Commercial No. 5	6.50	6.50	6.50	6.90
Wire Rods, O-H Cold Heading Quality No. 5	6.90	6.90	6.90	7.30
Bright Common Wire Nails	*7.80*	*7.80*	*7.80*	*8.10*

Oil Country Pipe: Mills withdrawn for remainder of the year.

†Per 82-lb. net, reel. §Per 100-lb kegs, 20d nails and heavier

Coal Chemicals

Spot, cents per gallon, ovens

Pure benzene	36.00
Toluene, one deg.	32.00-34.00
Industrial xylene	32.00-35.00

Per ton, bulk, ovens

Ammonium sulfate	$32.00
Birmingham area	36.00

Cents per pound, producing point

Phenol: Grade 1, 15.00; Grade 2-3, 14.50; Grade 4, 16.50; Grade 5, 15.25.

(Advertisement)

HOW JOHNSON* MAKES A BETTER OUTBOARD MOTOR WITH ALCOA SCREW MACHINE STOCK

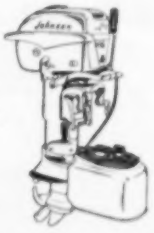
The outboard motor of 1921 was a heavy iron and brass thing that literally shook a boat to pieces. In that year, Johnson Motors and Alcoa changed the whole picture. The first Johnson Waterbug combined astounding lightness (35 pounds) with unheard-of power (2 hp) in a radical twin cylinder design. In three years, Johnson was the largest outboard manufacturer in the business.

Today, Johnson is still the largest. Its use of Alcoa® Aluminum Screw Machine Stock makes interesting reading to any manufacturer wanting to improve his product and make it sell faster.

Few products demand so much from machined parts as outboard motors—lightness, strength and corrosion resistance, too. These three advantages often set aluminum head and shoulders above other materials for screw machine parts. But consider the other advantages of aluminum which may have a more important place in your product. Exceptional machinability—limited almost entirely by machine capacity; high electrical and thermal conductivity; ease of finishing. These performance characteristics of Alcoa Screw Machine Stock, when coupled with the solid economic fact that you get three times as many parts per pound as with heavy metals, make up the total good sense of aluminum.

These are hard, commercial reasons why aluminum more than ever before should be carefully considered for every screw machine part you make or buy. Help in this type of analysis is available from every one of Alcoa's local sales offices listed in your phone book under "Aluminum." Aluminum Company of America, 874-G Alcoa Building, Pittsburgh 19, Pennsylvania.

*Johnson
MOTORS
Waukegan, Illinois



Chief Engineer, S. A. Metcalf (at right);
Ed Stoyonoff, Senior Draftsman (at left).

IN PURCHASING

Purchasing Agent, J. G. Kohler, says—"We have always used Alcoa Aluminum Screw Machine Stock and today we buy 100% of our requirements from Alcoa. We have never had a reject to my knowledge. It is this dependability of service, coupled with Alcoa technical help and Alcoa technical booklets, that keeps Alcoa strongly in our supply picture. Being the world's largest maker of outboard motors, we must schedule our buying closely to production. We know we can depend on Alcoa."

IN PRODUCTION

Foreman of Automatic Screw Machine department, F. H. Mitchell, says—"We run aluminum at the top capacity of our machines. Tolerances are often as close as two-tenths. Aluminum machines so easily that we often reduce the O. D. of a part with die chasers. We also find that the cutoff finish we get with aluminum is superior to brass and steel. Tool life is fine. Tool preparation for aluminum is easy. We use Alcoa booklets as standard reference material and aluminum gives us no headaches in production. We like it."

IN DESIGN

Chief Engineer, S. L. Metcalf, says—"Our prime design consideration at Johnson is putting the most power possible in every pound of motor. For this reason we naturally rely on aluminum for over 50 screw machine parts. In addition, we have severe corrosion requirements—another reason for our use of aluminum. The fact that we get three times as many parts per pound with aluminum as with heavy metals also helps us make a better motor at lower cost. Alcoa technical help is always at our disposal. Because we use so much aluminum on our motors, we frequently have threaded aluminum parts mated with other aluminum parts. In these cases, the ease of anodizing aluminum nicely avoids any possible problems of seizure and salt water corrosion."

Purchasing Agent, J. G. Kohler.

Foreman, F. H. Mitchell (at right);
James Hairrell, Machine Operator (at left).

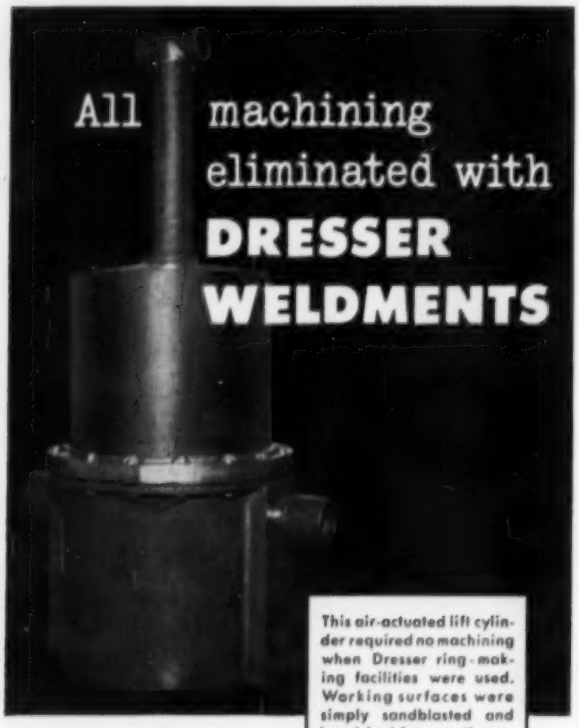
Typical parts made of Alcoa Aluminum Screw Machine Stock by Johnson Motors.

THE ALCOA HOUR
TELEVISION'S FINEST LIVE DRAMA
ALTERNATE SUNDAY EVENINGS

Your Guide to the Best in Aluminum Value

ALCOA ALUMINUM
SCREW MACHINE STOCK
ALCOA

All machining eliminated with DRESSER WELDMENTS



This air-actuated lift cylinder required no machining when Dresser ring-making facilities were used. Working surfaces were simply sandblasted and burnished for smoothness.

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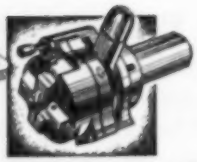

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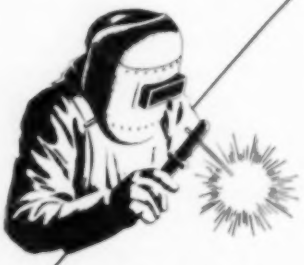

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Scrap Jumps Another $1

Strong advance staged despite strike as speculative factors combine with curtailed generation and smaller pig iron supply prospects to strengthen sentiment

Scrap Prices, Page 158

Philadelphia—New buying has resulted in further advances in most grades of iron and steel scrap. No. 1 heavy melting, No. 1 bundles and No. 1 busheling are $50, delivered; No. 2 heavy melting, $41; and No. 2 bundles, $38-$39. Electric furnace bundles have advanced to $53, delivered. These increases amount to $1, except for a lesser advance on No. 2 bundles.

New buying is by those mills that have continued to operate during the strike and by some strike-bound consumers who are storing material at points beyond their properties.

Mixed borings and turnings are higher at $36, delivered; machine shop turnings at $34; short shovel turnings at $38; heavy turnings at $46; and low phos structurals and plate at $54. Railroad specialties are unchanged.

No. 1 cupola is higher at $48-$50, delivered, the outside price being paid for car lots by Alan Wood Steel Co., Conshohocken, Pa. This buyer also closed on heavy breakable cast at $52 and drop-broken machinery at $56. The spread on drop-broken is $55-$56, delivered. Heavy breakable is unchanged, as is malleable.

Pittsburgh—Production managers are planning greater use of scrap per ton of finished steel. Pig iron production will be slow in starting after production resumes. Prices of major scrap grades are about $9 a ton lower than they were in late April. Results: The market is strengthening, and mills are building inventories.

Mills are paying $47 for No. 1 heavy melting scrap, an increase of $2 a ton the past week. Most other grades also increased similarly. The only inactivity is in turnings and borings.

Cleveland—Anticipating an early ending of the steel strike, a large Valley steelmaker last week closed on substantial tonnages of No. 2 grades at advances of about $10 per ton. No buying of the No. 1 grades was reported, but the higher prices on No. 2 steel served to put No. 1 quotations up $4, both in the Valley and Cleveland, with dealers expecting representative orders over the next week or so.

There is relatively little quality scrap available despite the month-long shutdown of the steel mills.

Chicago—Broker bidding for the more important grades of scrap gives a distorted impression of the market. Buying prices of mills unaffected by the strike are unchanged except for a few items. Speculative bids of brokers appear to stem from the fact that scrap generation is low.

New York — Brokers' buying prices have advanced sharply as a result of further buying, plus some continued business in open-hearth scrap for export. Brokers are offering $44-$45 for No. 1 heavy melting and No. 1 bundles, $35-$36 for No. 2 heavy melting, $32-$34 for No. 2 bundles, $25-$26 for machine shop turnings, with no change for mixed borings and turnings at $26-$27. They are paying more for short shovel turnings at $30-$31, and for low phos structural and plate at $47-$48.

Buffalo — No. 1 heavy melting scrap is up $2 a ton to $44-$45 on small local purchases and higher prices paid at points to which Buffalo dealers often ship. New business is confined to small lots of the most wanted grades, but the market undertone is definitely stronger. Turnings are up $2 a ton. The cast iron grades continue soft with the foundries still holding out of the market.

Cincinnati — Anticipatory buy-buying by brokers has strengthened the market here, with prices on most blast furnace grades rising $1.

Detroit — There are no price changes in the scrap market here. Automotive lists will be closing this week, and the outcome of bids will tell the story for the immediate future.

St. Louis — Scrap is moving slowly, though demand has improved. Brokers' buying prices are up $2 to $5 on heavy melting, bundles and busheling. Rail scrap is quoted $1 to $4 higher. Increases are stimulating a better flow of material to dealers' yards.

Birmingham — All segments of the scrap market are active despite the steel strike. Electric furnace bundles and specialties prices are rising. Considerable tonnage is moving north to mills unaffected by the strike.

Seattle—Scrap market activity is confined largely to exports. Local purchases are small, with only two of the smaller steel plants in this area operating. Prices are nominal, but receipts at local yards are fairly large.

Los Angeles—Exports and shipments to Kaiser Steel Corp.'s Fontana plant are sustaining the scrap market here.

San Francisco—The steel scrap market is firm despite the absence of buying by the area's two largest consumers.

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Iron and Steel Scrap

Consumer prices, per gross ton, except as otherwise noted, including broker's commission, as reported to STEEL. *Changes shown in italics.*

STEELMAKING SCRAP COMPOSITE

July 25	$47.50
July 18	46.50
June Avg.	46.04
July 1955	39.67
July 1951	44.00

Based on No. 1 heavy melting grade at Pittsburgh, Chicago and eastern Pennsylvania.

PITTSBURGH

No. 1 heavy melting	*46.00-47.00*
No. 2 heavy melting	*41.00-42.00*
No. 1 bundles	*46.00-47.00*
No. 2 bundles	*38.00-39.00*
No. 1 busheling	*46.00-47.00*
Machine shop turnings	32.00-33.00
Mixed borings, turnings	32.00-33.00
Short shovel turnings	36.00-37.00
Cast iron borings	36.00-37.00
Cut structurals, 3 ft lengths	*56.00-57.00*
Heavy turnings	*44.00-45.00*
Punchings & plate scrap	*56.00-57.00*
Electric furnace bundles	*56.00-57.00*

Cast Iron Grades

No. 1 cupola	48.00-49.00
Charging box cast	44.00-45.00
Heavy breakable cast	44.00-45.00
Unstripped motor blocks	32.00-33.00
No. 1 machinery cast	54.00-55.00

Railroad Scrap

No. 1 R.R. heavy melt.	*55.00-56.00*
Rails, 2 ft and under	*67.00-68.00*
Rails, 18 in. and under	*68.00-69.00*
Rails, random lengths	*63.00-64.00*
Railroad specialties	*61.00-62.00*

Stainless Steel Scrap

18-8 bundles & solids	360.00-375.00
18-8 turnings	255.00-270.00
430 bundles & solids	110.00-120.00
430 turnings	60.00-65.00

CLEVELAND

No. 1 heavy melting	*45.00-46.00*
No. 2 heavy melting	*40.00-41.00*
No. 1 bundles	*45.00-46.00*
No. 2 bundles	*36.00-37.00*
No. 1 busheling	*45.00-46.00*
Machine shop turnings	26.00-27.00
Mixed borings, turnings	30.00-31.00
Short shovel turnings	30.00-31.00
Cast iron borings	30.00-31.00
Low phos.	*46.00-47.00*
Cut structural plates 2 ft and under	*55.00-56.00*
Alloy free, short shovel turnings	37.00-38.00
Electric furnace bundles	*45.00-46.00*

Cast Iron Grades

No. 1 cupola	*53.00-54.00*
Charging box cast	*39.00-40.00*
Heavy breakable cast	*43.00-44.00*
Stove plate	*50.00-51.00*
Unstripped motor blocks	*28.00-29.00*
Brake shoes	*38.00-39.00*
Clean auto cast	*52.00-53.00*
Burnt cast	*38.00-39.00*
Drop broken machinery	*54.00-55.00*

Railroad Scrap

No. 1 R.R. heavy melt.	49.00-50.00
R.R. malleable	54.00-55.00
Rails, 2 ft and under	*65.00-66.00*
Rails, 18 in. and under	*66.00-67.00*
Rails, random lengths	*60.00-61.00*
Cast steel	*52.00-53.00*
Railroad specialties	51.00-52.00
Uncut tires	53.00-53.00
Angles, splice bars	*60.00-61.00*
Rails, rerolling	*63.00-64.00*

Stainless Steel

(Brokers' buying prices; f.o.b. shipping point)

18-8 bundles, solids	*380.00-390.00*
18-8 turnings	*250.00-260.00*
430 clips, bundles, solids	100.00-110.00
430 turnings	50.00-60.00

YOUNGSTOWN

No. 1 heavy melting	*49.00-50.00*
No. 2 heavy melting	*44.00-45.00*
No. 1 bundles	*49.00-50.00*
No. 2 bundles	*40.00-41.00*
No. 1 busheling	*49.00-50.00*
Machine shop turnings	27.00-28.00
Short shovel turnings	32.00-33.00
Cast iron borings	32.00-33.00
Low phos.	*50.00-51.00*
Electric furnace bundles	*50.00-51.00*

Railroad Scrap

No. 1 R.R. heavy melt.	51.00-52.00

CHICAGO

No. 1 heavy melting	44.00-45.00
No. 2 heavy melting	38.00-39.00
No. 1 factory bundles	48.00-49.00
No. 1 dealer bundles	44.00-45.00
No. 2 bundles	*34.00-35.00*
No. 1 busheling	44.00-45.00
Machine shop turnings	23.00-24.00
Mixed borings, turnings	25.00-26.00
Short shovel turnings	25.00-26.00
Cast iron borings	25.00-26.00
Cut structurals, 3 ft	52.00-53.00
Punchings & plate scrap	53.00-54.00

Cast Iron Grades

No. 1 cupola	45.00-46.00
Stove plate	40.00-41.00
Unstripped motor blocks	*33.00-34.00*
Clean auto cast	*48.00-49.00*
Drop broken machinery	48.00-49.00

Railroad Scrap

No. 1 R.R. heavy melt.	49.00-50.00
R.R. malleable	58.00-59.00
Rails, 18 in. and under	*68.00-69.00*
Rails, 2 ft and under	*67.00-68.00*
Angles, splice bars	62.00-63.00
Rails, rerolling	*68.00-69.00*

Stainless Steel Scrap

18-8 bundles & solids	380.00-395.00
18-8 turnings	270.00-280.00
430 bundles & solids	105.00-110.00
430 turnings	52.50-57.50

DETROIT

(Brokers' buying prices; f.o.b. shipping point)

No. 1 heavy melting	*42.00*
No. 2 heavy melting	32.00
No. 1 bundles	42.00
No. 2 bundles	29.00
No. 1 busheling	40.00
Machine shop turnings	23.00
Mixed borings, turnings	23.00
Short shovel turnings	27.00
Punchings & plate scrap	*53.00*

Cast Iron Grades

No. 1 cupola	46.00
Charging box cast	38.00
Stove plate	38.00
Heavy breakable	38.00
Unstripped motor blocks	25.00
Clean auto cast	51.00
Malleable	51.00

BIRMINGHAM

No. 1 heavy melting	34.00-35.00
No. 2 heavy melting	32.00-33.00
No. 1 bundles	34.00-35.00
No. 2 bundles	24.00-25.00
No. 1 busheling	34.00-35.00
Cast iron borings	20.00-21.00
Short shovel turnings	27.00-28.00
Machine shop turnings	25.00-26.00
Electric furnace bundles	*43.00-44.00*

Cast Iron Grades (F.o.b. shipping point)

No. 1 cupola	48.50-49.50
Stove plate	47.00-48.00
Bar crops and plate	51.00-52.00
Structural & plate, 2 ft	*50.00-51.00*
Unstripped motor blocks	37.50-38.50
Charging box cast	32.00-33.00
No. 1 wheels	39.00-40.00

Railroad Scrap

No. 1 R.R. heavy melt.	45.00-46.00
Rails, 18-in. and under	*60.00-61.00*
Rails, rerolling	64.00-65.00
Rails, random lengths	*56.00-57.00*
Angles, splice bars	54.00-55.00

PHILADELPHIA

No. 1 heavy melting	*50.00*
No. 2 heavy melting	*41.00*
No. 1 bundles	*50.00*
No. 2 bundles	*33.00-39.00*
No. 1 busheling	*50.00*
Electric furnace bundles	*53.00*
Mixed borings, turnings	*36.00*
Machine shop turnings	*34.00*
Short shovel turnings	*38.00*
Heavy turnings	*46.00*
Structurals & plates	*54.00*
Couplers, springs, wheels	51.00
Rail crops, 2 ft & under	54.00

Cast Iron Grades

No. 1 cupola	*48.00-50.00*
Malleable	65.00-67.00
Heavy breakable cast	52.00
Drop broken machinery	54.00-56.00

NEW YORK

(Brokers' buying prices)

No. 1 heavy melting	*44.00-45.00*
No. 2 heavy melting	*35.00-36.00*
No. 1 bundles	*44.00-45.00*
No. 2 bundles	*32.00-34.00*
Machine shop turnings	*25.00-26.00*
Mixed borings, turnings	26.00-27.00
Short shovel turnings	*30.00-31.00*
Low phos. (structural & plate)	*47.00-48.00*

Cast Iron Grades

No. 1 cupola	44.00-45.00
Unstripped motor blocks	32.00-34.00
Heavy breakable	44.00-45.00

Stainless Steel

18-8 sheets, clips, solids	340.00-350.00
18-8 borings, turnings	170.00-180.00
430 sheets, clips, solids	120.00-125.00
410 sheets, clips, solids	100.00-105.00

BOSTON

(Brokers' buying prices; f.o.b. shipping point)

No. 1 heavy melting	38.50-39.00
No. 2 heavy melting	30.00-31.00
No. 1 bundles	38.50-39.00
No. 2 bundles	28.00-29.00
No. 1 busheling	38.00-39.00
Machine shop turnings	21.00-22.00
Mixed borings, turnings	23.00-23.50
Short shovel turnings	24.00-24.50
No. 1 cast	42.00-42.50
Mixed cupola cast	37.50-38.00
No. 1 machinery cast	43.50-44.00

BUFFALO

No. 1 heavy melting	*44.00-45.00*
No. 2 heavy melting	*34.00-35.00*
No. 1 bundles	*44.00-45.00*
No. 2 bundles	*31.00-32.00*
No. 1 busheling	*44.00-45.00*
Mixed borings, turnings	*29.00-30.00*
Machine shop turnings	*27.00-28.00*
Short shovel turnings	*30.00-31.00*
Cast iron borings	*29.00-30.00*
Low phos.	*49.00-50.00*

Cast Iron Grades (F.o.b. shipping point)

No. 1 cupola	44.00-45.00
No. 1 machinery	49.00-50.00

Railroad Scrap

Rails, random lengths	*57.00-58.00*
Rails, 3 ft and under	*61.00-62.00*
Railroad specialties	50.00-51.00

CINCINNATI

(Brokers' buying prices; f.o.b. shipping point)

No. 1 heavy melting	*44.00-45.00*
No. 2 heavy melting	*35.00-36.00*
No. 1 bundles	*44.00-45.00*
No. 2 bundles	*32.00-33.00*
No. 1 busheling	*44.00-45.00*
Machine shop turnings	*26.50-27.50*
Mixed borings, turnings	28.50-29.50
Short shovel turnings	30.50-31.50
Cast iron borings	28.50-29.50
Low phos., 18 in.	*54.00-55.00*

Cast Iron Grades

No. 1 cupola	44.00-45.00
Heavy breakable cast	44.00-45.00
Charging box cast	44.00-45.00
Drop broken machinery	54.00-55.00

Railroad Scrap

No. 1 R.R. heavy melt.	50.00-51.00
Rails 18 in. and under	66.00-67.00
Rails random lengths	59.00-60.00

ST. LOUIS

(Brokers' buying prices)

No. 1 heavy melting	*42.00*
No. 2 heavy melting	*39.00*
No. 1 bundles	*42.00*
No. 2 bundles	*35.00*
No. 1 busheling	*42.00*
Machine shop turnings	24.00
Short shovel turnings	28.00

Cast Iron Grades

No. 1 cupola	44.00
Charging box cast	37.00
Heavy breakable cast	37.00
Unstripped motor blocks	32.00
Brake shoes	45.00
Clean auto cast	46.00
Stove plate	39.50

Railroad Scrap

No. 1 R.R. heavy melt.	*52.50*
Rails, 18 in. and under	*66.00*
Rails, random lengths	*58.00*
Rails, rerolling	*72.00*
Angles, splice bars	*56.00*

SEATTLE

No. 1 heavy melting	43.00-44.00
No. 2 heavy melting	39.00-40.00
No. 1 bundles	39.00-40.00
No. 2 bundles	30.00-31.00
No. 3 bundles	20.00
Machine shop turnings	23.00-25.00
Mixed borings, turnings	23.00-25.00
Electric furnace No. 1	52.00-54.00

Cast Iron Grades

No. 1 cupola	42.00-45.00
Heavy breakable cast	36.00-38.00
No. 1 wheels	37.00
Unstripped motor blocks	40.00
Stove plate (f.o.b. plant)	30.00-31.00
Brake shoes	38.00

Railroad Scrap

Rails, random lengths	43.00-44.00

LOS ANGELES

No. 1 heavy melting	41.00
No. 2 heavy melting	37.00
No. 1 bundles	40.00
No. 2 bundles	30.00
Machine shop turnings	21.00

Cast Iron Grades (F.o.b. shipping point)

No. 1 cupola	46.00

SAN FRANCISCO

No. 1 heavy melting	43.00
No. 2 heavy melting	40.00
No. 1 bundles	42.00
No. 2 bundles	35.00
Machine shop turnings	20.00-23.00
Mixed borings, turnings	20.00-23.00
Cast iron borings	20.00-23.00
Heavy turnings	20.00-23.00
Short shovel turnings	25.00
Cut structurals	45.00
Punchings & plate scrap	44.00

Cast Iron Grades

No. 1 cupola	48.00
Charging box cast	42.00
Stove plate	39.00
Heavy breakable cast	39.00
Unstripped motor blocks	38.00
Brake shoes	35.00
Clean auto cast	48.00
No. 1 wheels	39.00
Burnt cast	23.00
Drop broken machinery	50.00

HAMILTON, ONT.

No. 1 heavy melting	43.00
No. 2 heavy melting	38.00
No. 1 bundles	40.00
No. 2 bundles	35.50
Mixed steel scrap	37.00
Busheling, new factory: Prepared	41.00
Unprepared	37.00
Short steel turnings	20.00

Cast Iron Grades†

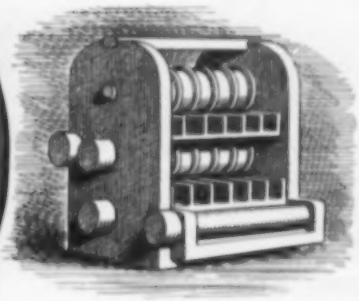
No. 1 machinery cast	50.00

†F.o.b., shipping point.

GREAT MOMENTS IN THE HISTORY OF IRON AND STEEL MAKING

Birthplace of John Fritz. Londonderry Township, Chester County, Pa.

John Fritz



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LEADERS IN IRON AND STEEL SCRAP SINCE 1889

Copper Prices Being Tested

Some buyers feel there may be another price drop for the red metal. Wire and cable makers buy actively, but brass mills continue to work off inventories

Nonferrous Metal Prices, Pages 162 & 163

"WE'RE GOING through a testing period," explains a copper executive. "While primary prices have been lowered to 40 cents a pound, some may still feel that there may be another nose dive; others are waiting to see what will happen in the steel negotiations."

Says another: "There is a rising demand, and in the meantime we are building our inventories a bit." Most primary producers report that booming wire and cable makers are taking up most of the slack created by the failure of brass mills to purchase normal quotas.

Reaction—The Chilean government has remained quiet about how the falling price of copper will hurt its economy. Anaconda Co. and Kennecott Copper Corp., the American copper companies in Chile, agreed several months ago that they would base payments to Chile on the London Metal Exchange or American quotations, depending on which one was higher. This would enable Chile to receive top price for its metal.

With the falling prices, the London Metal Exchange bid price was 35.12 cents per pound on July 24. U.S. custom smelters' price: 38 cents per pound. Chilean finance ministers have complained that they would be in serious trouble if the price fell below 43 cents a pound.

Brass mills continue to work off inventories. Many mills are on vacation, too.

Aluminum Skies Bright

Aluminum sales are registering normal seasonal dips, report aluminum producers. The steel strike has had little or no effect on pig and ingot sales.

While sheet shipments for fabricated products are off, aluminum cable makers are heading for a record year. Foil sales continue at peak levels, and extruders (particularly garden furniture and window frame manufacturers) are enjoying banner sales.

While there is an over-all seasonal dip in third quarter sales, aluminum advocates are brimming with confidence. Most are already receiving fourth quarter orders. One spokesman reveals that his company has sold almost all its available fourth quarter metal.

Talks with the United Steelworkers Union, representing 18,000 aluminum workers, and the Aluminum Co. of America are still in the preliminary stages. The Aluminum Workers International Union (10,000 workers) has opened its talks with Alcoa on wages (fringe benefits are covered in a previous contract). Its demand: a 25 cent an hour increase.

Lead, Zinc Sales Dive

What has happened to the battery makers? This question was asked by many lead men this month because battery makers failed to follow the historical pattern of entering the market in July.

Explanations: 1. Battery manufacturers are working off inventories which have been overextended. 2. Vacations are cutting into production schedules. 3. Battery companies were being cautious until after the steel strike.

Zinc sales are almost nonexistent.

Thoughts on Magnesium

The Office of Defense Mobilization is considering the opening of expansion goals for magnesium. This might mean that Dow Chemical Co. will be permitted to purchase the Velasco, Tex., electrolytic magnesium plant which it operates for the government. Velasco facilities could be expanded and modernized, but no company is willing to invest money in a plant which may be sold out from under it. Irony: The Justice department has blocked the purchase, saying that it would make Dow more of a monopoly in magnesium if it owned rather than only operated the Velasco works.

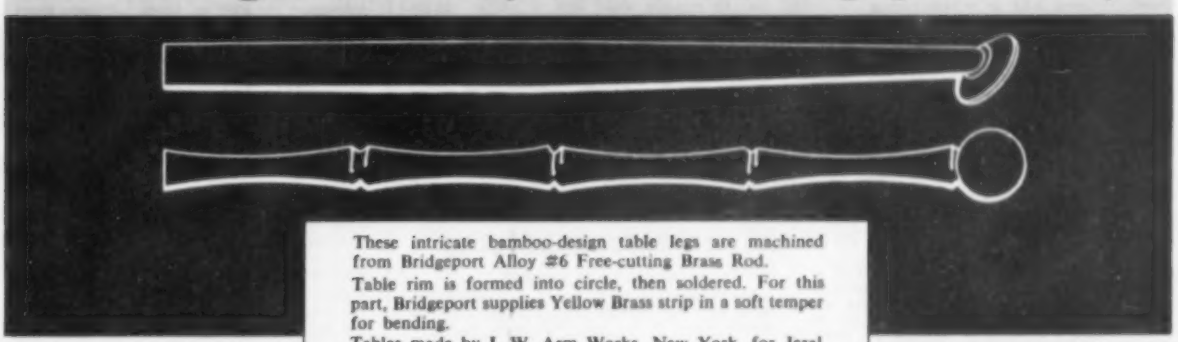
Outlook: Any approved expansion goals may have a rider attached which would specify that new facilities should be in diversified locations. With the Freeport and Velasco works of Dow only 7 miles apart, labor trouble or any enemy attack could tie up 75,000 tons (annual) of magnesium capacity. Next year (STEEL, July 23, p. 112) Brooks & Perkins Inc. and Dominion Magnesium Ltd. will add 10,000 tons to U.S. magnesium capacity with a new $7 million plant at Selma, Ala.

DAILY NONFERROUS PRICE RECORD

	July 25 Price		Last Change	Previous Price	June Avg.	May Avg.	July 1955 Avg.
Copper	38.00-40.00	July	12, 1956	37.50-43.00	43.000	45.296	36.000
Lead	15.80	Jan.	13, 1956	16.30	13.800	13.800	14.800
Zinc	13.50	Jan.	6, 1956	13.00	13.500	13.500	12.250
Tin	97.75	July	25, 1956	95.75	94.611	97.024	97.045
Nickel	64.50	Nov.	24, 1954	60.00	64.500	64.500	64.500
Aluminum	25.90	Mar.	29, 1956	24.40-25.90	25.900	25.900	23.200
Magnesium	33.75	Apr.	16, 1956	32.50	33.750	33.750	28.500

Quotations in cents per pound based on: COPPER, deld. Conn. Valley; LEAD, common grade, deld. St. Louis; ZINC, prime western, E. St. Louis; TIN, Straits, deld. New York; NICKEL, electrolytic cathodes, 99.9%, base size at refinery, unpacked; ALUMINUM, primary ingots, 99 + %, deld.; MAGNESIUM, pig, 99.8%, Velasco, Tex.

Matching metal to job with Bridgeport alloys



These intricate bamboo-design table legs are machined from Bridgeport Alloy #6 Free-cutting Brass Rod.
Table rim is formed into circle, then soldered. For this part, Bridgeport supplies Yellow Brass strip in a soft temper for bending.
Tables made by I. W. Arm Works, New York, for Jeral Brass Products, New York, N.Y.

For machined parts with a furniture finish...
Bridgeport HIGH I.Q.* rod

When finish is a factor – as in these unusual machining jobs – it's important that you choose the alloy with exactly the *right* combination of physical properties. Bridgeport's wide range of quality alloys and technical experience in practical production problems make it easy to match the right metal to your product or design. For brass, copper or aluminum, call or write your Bridgeport Sales Office today. They'll also be glad to arrange for Bridgeport Technical Service on your metals and methods.

**High Inner Quality*

BRIDGEPORT BRASS

Offices in Principal Cities • Conveniently Located Warehouses

Bridgeport Brass Company, Bridgeport 2, Connecticut • In Canada: Noranda Copper and Brass Limited, Montreal

Nonferrous Metals

Cents per pound, carlots, except as otherwise noted

PRIMARY METALS AND ALLOYS

Aluminum: 99 + %, ingots, 25.90; pigs, 24.00, 10,000 lb or more, f.o.b. shipping point. Freight allowed on 500 lb or more.

Aluminum Alloy: No. 13, 12% Si, 27.70; No. 43, 5% Si, 27.50; No. 195, 4.5% Cu, 0.8% Si, 29.30; No. 214, 3.8% Mg, 29.30; No. 356, 7% Si, 0.3% Mg, 27.70.

Antimony: R.M.M. brand, 99.5%, 33.00; Lone Star brand, 33.50, f.o.b. Laredo, Tex., in bulk. Foreign brands, 99.5%, 27.00-28.00, New York, duty paid, 10,000 lb or more.

Beryllium: 97%, lump or beads, $71.50 per lb, f.o.b. Cleveland or Reading, Pa.

Beryllium Aluminum: 5% Be, $74.75 per lb of contained Be, f.o.b. Reading, Pa., Elmore, O.

Beryllium Copper: 3.75-4.25% Be, $43 per lb of contained Be, with balance as Cu at market price on shipment date, f.o.b. Reading, Pa., or Elmore, O.

Bismuth: $2.25 per lb ton lots.

Cadmium: Sticks and bars, $1.70 per lb deld.

Cobalt: 97-99%, $2.60 per lb for 550-lb keg; $2.62 per lb for 100-lb case; $2.67 per lb under 100 lb.

Columbium: Powder, $119.20 per lb, nom.

Copper: Electrolytic, 40.00 deld. Conn. valley; 40.00 deld. Midwest; custom smelters, 38.00 deld.; lake, 40.00 deld.; fire refined, 39.75 deld.

Germanium: First reduction, $201.85-$220 per lb; intrinsic grade, $220-$242.67 per lb, depending on quantity.

Gold: U. S. Treasury, $35 per oz.

Indium: 99.9%, $2.25 per troy oz.

Iridium: $100-$110 nom. per troy oz.

Lead: Common, 15.80; chemical, 15.90; corroding, 15.90, St. Louis. New York basis, add 0.20.

Lithium: 99 +, cups or ingots, $11.50; rod $13.50; shot or wire, $14.50, f.o.b. Minneapolis, 100 lb lots.

Magnesium: Pig, 23.75 f.o.b. Velasco, Tex.; ingot, 34.50 f.o.b. Velasco, Tex.

Magnesium Alloys: AZ91B (diecasting), 35.00 deld.; AZ63A, AZ92A. AZ91C (sand casting), 39.25 f.o.b. Velasco, Tex.

Mercury: Open market, spot, New York, $255-$257 per 76-lb flask.

Molybdenum: Powder, 99% hydrogen reduced, $3.20 per lb; pressed ingot, $4.06 per lb; sintered ingot, $5.53 per lb.

Nickel: Electrolytic cathodes, sheets (4 x 4 in. and larger), unpacked, 64.50; 10-lb pigs, unpacked, 67.65; "XX" nickel shot, 69.00; "F" nickel shot or ingots for addition to cast iron, 64.50; prices f.o.b. Port Colborne, Ont., including import duty. New York basis add 0.92.

Osmium: $80-$100 per troy oz, nom.

Palladium: $23-$24 per troy oz.

Platinum: $103-$110 per troy oz from refineries.

Radium: $16-$21.50 per mg radium content, depending on quantity.

Rhodium: $118-$125 per troy oz.

Ruthenium: $45-$55 per troy oz.

Selenium: 99.5%, $13.50-$15.50 per lb.

Silver: Open market, 99.125 per troy oz.

Sodium: 16.50, c.l.; 17.00, l.c.l.

Tantalum: Sheet, rod, $68.70 per lb; powder, $56.63 per lb.

Tellurium: $1.50-$1.75 per lb.

Thallium: $12.50 per lb.

Tin: Straits, N. Y., spot and prompt, 96.375.

Titanium: Sponge, 99.3+%, grade A-1 ductile (0.3% Fe max), $3.00; grade A-2 (0.5% Fe max), $2.70 per pound.

Tungsten: Powder, 98.8%, carbon reduced, 1000-lb lots, $4.50 per lb, nom, f.o.b. shipping point; less than 1000 lb add 15.00; 99+% hydrogen reduced, $5.00. Treated ingot, $6.70.

Zinc: Prime Western, 13.50; brass special, 13.75; intermediate, 14.00, East St. Louis, freight allowed over 0.50 per pound. High grade, 14.85; special high grade, 15.25 deld. Diecasting alloy ingot No. 3, 18.00; No. 2, 19.00; No. 5, 18.50, deld.

Zirconium: Ingots, commercial grade, $14.40 per lb; low-hafnium reactor grade, $23.07. Sponge, commercial grade, $7.50-$10.60 per lb, depending on quantity; reactor grade, $14.60-$22.60 per lb, depending on quantity. Powder, electronics grade, $15 per lb; flash grade, $11.50.

(Note: Chromium, manganese and silicon metals are listed in ferroalloy section.)

SECONDARY METALS AND ALLOYS

Aluminum Ingot: Piston alloys, 26.00-28.25; No. 12 foundry alloy (No. 2 grade), 24.25-25.50; 5% silicon alloy, 0.60 Cu max, 25.75-27.00; 13 alloy, 0.60 Cu max, 25.75-27.00; 195 alloy, 26.25-27.50; 108 alloy, 24.75-25.50. Steel deoxidizing grades, notch bars, granulated or shot: Grade 1, 25.50; grade 2, 24.75; grade 3, 24.00; grade 4, 23.50.

Brass Ingot: Red brass, No. 115, 35.50; tin bronze, No. 225, 48.00; No. 245, 41.50; high-leaded tin bronze, No. 305, 39.75; No. 1 yellow No. 405, 30.75; manganese bronze, No. 421, 31.25.

Magnesium Alloy Ingot: AZ63A, 36.00; AZ91B, 36.00; AZ91C, 36.00; AZ92A, 36.00.

NONFERROUS PRODUCTS

BERYLLIUM COPPER

(Base prices per lb, plus mill extras, 2000 to 5000 lb, f.o.b. Temple, Pa.; nominal 1.9% Be alloy) Strip, $1.92; rod, bar, wire, $1.89.

COPPER WIRE

Bare, soft, f.o.b. eastern mills, 30,000-lb lots, 45.355; l.c.l., 45.96. Weatherproof, 30,000-lb lots, 43.78; l.c.l., 44.53. Magnet wire deld., 15,000 lb or more, 52.68; l.c.l., 53.43.

LEAD

(Prices to jobbers, f.o.b. Buffalo, Cleveland, Pittsburgh) Sheets, full rolls, 140 sq ft or more, $21.50 per cwt; pipe, full coils, $21.50 per cwt; traps and bends, list prices plus 30%.

TITANIUM

(Prices per lb, 10,000 lb and over, f.o.b. mill) Sheets, $12.60-$13.10; sheared mill plate, $10.00-$12.00; strip, $12.10-$12.60; wire, $9.00-$11.50; forging billets, $7.25-$7.50; hot-rolled and forged bars, $7.55-$7.80.

ZINC

(Prices per lb, c.l., f.o.b. mill) Sheets, 24.00; ribbon zinc in coils, 21.50; plates, 20.00.

ZIRCONIUM

Plate, $22; H.R. strip, $19; C.R. strip, $29; forged or H.R. bars, $17; wire, 0.015 in., 1.60c per linear foot.

NICKEL, MONEL, INCONEL

	"A" Nickel	Monel	Inconel
Sheets, C.R.	102	83	99
Strip, C.R.	102	92	125
Plate, H.R.	97	87	95
Rod, Shapes, H.R.	87	74	93
Seamless Tubes	122	110	153

ALUMINUM

Screw Machine Stock: 30,000 lb base.

Diam. (in.) or across flats	Round 2011-T3	Round 2017-T4	Hexagonal 2011-T3	Hexagonal 2017-T4
Drawn				
0.125	60.4	67.9	...	...
0.156-0.172	59.0	57.4	...	...
0.188	59.0	57.4	...	73.2
0.219-0.234	56.0	54.4	...	...
0.250-0.281	56.0	54.4	...	69.9
0.313	56.0	54.4	...	66.7
Cold-finished				
0.375-0.547	54.9	52.9	65.2	62.8
0.563-0.688	54.9	52.9	62.1	59.0
0.750-1.000	53.6	51.6	56.9	55.7
1.063	53.6	51.6	...	53.8
1.125-1.500	51.6	49.7	55.1	53.8
Rolled				
1.563	50.3	48.4	...	...
1.625-2.000	49.7	47.7	...	52.0
2.125-2.500	48.5	46.5	...	...
2.563-3.375	47.1	45.1	...	...

ALUMINUM (Continued)

Sheets and Circles: 1100 and 3003 mill finish (30,000 lb base; freight allowed)

Thickness Range, Inches	Flat Sheet	Flat Sheet Circles*	Coiled Sheet	Coiled Sheet Circles†
0.249-0.136	39.0	43.5	...	...
0.135-0.096	39.5	44.7	37.5	42.4
0.095-0.077	40.2	45.7	37.6	42.8
0.076-0.061	40.8	46.6	37.8	43.0
0.060-0.048	41.4	47.1	38.2	43.5
0.047-0.038	41.9	48.9	38.7	43.9
0.037-0.030	42.3	48.5	39.1	44.6
0.029-0.024	42.9	49.6	39.4	45.1
0.023-0.019	43.7	50.5	40.3	46.0
0.018-0.017	44.5	...	40.9	46.9
0.016-0.015	45.4	...	41.7	48.1
0.014	46.4	...	42.7	49.4
0.013-0.012	47.6	...	43.4	50.4
0.011	48.6	...	44.6	52.0
0.010-0.0095	49.9	...	45.8	53.7
0.009-0.0085	51.2	...	47.3	55.8
0.008-0.0075	52.8	...	48.5	57.6
0.007	54.3	...	50.0	59.9
0.006	55.9	...	51.4	64.9

*48 in. max diam. †26 in. max diam.

Plates and Circles: Thickness 0.250-3 in., 24-60 in. width or diam, 72-240 in. lengths.

Alloy	Plate Base	Circle Base
1100-F, 2003-F	38.0	42.3
5050-F	39.1	43.4
3004-F	40.1	45.3
5052-F	41.4	46.7
6061-T6	42.6	47.5
2024-T4*	45.1	51.4
7075-T6*	52.9	60.0

*24-48 in. widths or diam, 72-180 lengths.

Forging Stock: Round, Class 1, 40.60-51.60 in specific lengths 36-144 in. diameters 0.375-8 in. Rectangles and squares, Class 1, 44.50-57.70 in random lengths, 0.375-4 in. thick, width 0.750-10 in.

Pipe: ASA schedule 40, alloy 6063-T6, 20-ft length, plain ends, 90,000-lb base, per 100 ft.

Nom. Pipe Size (in.)		Nom. Pipe Size (in.)	
¾	$17.45	2	$ 53.85
1	27.35	4	148.60
1¼	37.65	6	266.55
1½	44.30	8	401.10

Extruded Solid Shapes:

Factor	Alloy 6063-T5	Alloy 6061-T6	Alloy 6062-T6
9-11	43.50-45.00	58.80-62.90	58.30-62.40
12-14	43.80-45.20	59.50-63.80	59.00-63.30
15-17	44.00-45.70	60.70-65.40	60.20-64.90
18-20	44.50-46.20	62.60-67.80	62.10-67.30

MAGNESIUM

Sheet and Plate: AZ31A standard grade, .032 in., 100.00; .081 in., 75.00; .188 in., 66.50; .250-2.0 in., 65.60. AZ31A special grade, .032 in., 163.10; .081 in., 103.50; .188 in., 91.10; .250-2.0, 88.90. Tread plate, .188 in., 68.90; .250-2.0 in., 67.80. Tooling plate, .250-3.0 in., 79.20.

Extruded Solid Shapes:

Factor	Com. Grade (FS)	Spec. Grade (AZ31B)
6-8	66.40-69.00	81.40-84.00
12-14	67.50-69.60	82.50-84.60
24-26	72.10-72.70	87.10-87.70
36-38	84.90-85.80	99.90-100.80

NONFERROUS SCRAP

DEALERS' BUYING PRICES

(Cents per pound, New York, in ton lots)

Aluminum: 1100 clippings, 16.50-17.00; old sheets, 13.00-13.50; borings and turnings, 8.00-

BRASS MILL PRICES

MILL PRODUCTS a

	Sheet, Strip, Plate	Rod	Wire	Seamless Tube	Clean Heavy	Rod Ends	Clean Turnings
Copper	61.63b	58.86c	....	61.82	36.000	36.000	35.250
Yellow Brass	52.10	42.65d	52.64	55.01	27.250	27.000	25.125
Low Brass, 80%	55.55	55.79	56.39	58.66	30.625	30.375	29.875
Red Brass, 85%	57.19	57.13	57.73	60.00	31.875	31.625	31.125
Com. Bronze, 90%	59.08	59.02	59.62	61.84	33.125	32.875	32.375
Manganese Bronze	59.46	53.56	63.80	....	25.250	25.000	24.500
Muntz Metal	53.84	49.85	....	....	25.500	25.250	24.750
Naval Brass	55.72	50.03	62.78	58.58	25.250	25.000	24.500
Silicon Bronze	65.22	64.41	65.26	67.26e	35.000	34.750	34.000
Nickel Silver, 10%	67.76	70.09g	70.09	....	32.750	32.500	16.375
Phos. Bronze, A, 5%	79.58	80.08	80.08	81.26	36.250	36.000	35.000

a. Cents per lb, f.o.b. mill; freight allowed on 500 lb or more. b. Hot-rolled. c. Cold-drawn. d. Free cutting. e. 3% silicon. f. Prices in cents per lb for less than 20,000 lb, f.o.b. shipping point. On lots over 20,000 lb at one time, of any or all kinds of scrap, add 1 cent per lb. g. Leaded

SCRAP ALLOWANCES f

8.50; crankcases, 13.00-13.50; industrial castings, 13.00-13.50.

Copper and Brass: No. 1 heavy copper and wire, 29.50-30.00; No. 2 heavy copper and wire, 28.00-28.50; light copper, 25.50-26.00; No. 1 composition red brass, 23.50-24.00; No. 1 composition turnings, 23.00-23.50; yellow brass turnings, 14.00-14.50; new brass clippings, 21.50-23.00; light brass, 13.50-14.00; heavy yellow brass, 15.50-16.00; new brass rod ends, 19.50-20.00; auto radiators, unsweated, 16.50-17.00; cocks and faucets, 18.50-19.00; brass pipe, 18.00-18.50.

Lead: Heavy, 12.00-12.25; battery plates, 6.50-6.75; linotype and stereotype, 13.50-14.00; electrotype, 12.75-13.00; mixed babbitt, 14.50.

Monel: Clippings, 55.00-85.00; old sheets, 55.00-85.00; turnings, 60.00-70.00; rods, 55.00-85.00.

Nickel: Sheets and clips, 90.00-190.00; rolled anodes, 90.00-190.00; turnings, 80.00-150.00; rod ends, 90.00-190.00.

Zinc: Old zinc, 5.00-5.50; new die-cast scrap, 4.00-4.50; old die-cast scrap, 3.00.

REFINERS' BUYING PRICES

(Cents per pound, carlots, delivered refinery)

Aluminum: 1100 clippings, 19.00-19.50; 3003 clippings, 19.00-19.25; 6151 clippings, 19.00-19.25; 5052 clippings, 19.00-19.25; 2014 clippings, 18.00-18.75; 2017 clippings, 18.00-18.75; 2024 clippings, 18.00-18.75; mixed clippings, 17.75-18.00; old sheets, 16.25-16.50; old cast, 16.25-16.50; clean old cable (free of steel), 18.00-19.00; borings and turnings, 15.75-17.50.

Beryllium Copper: Heavy scrap, 0.020-in. and heavier, not less than 1.5% Be, 62.00; light scrap, 57.00; turnings and borings, 42.00.

Copper and Brass: No. 1 heavy copper and wire, 33.50; No. 2 heavy copper and wire, 31.00; light copper, 28.75; refinery brass (60% copper) per dry copper content, 29.00.

INGOTMAKERS' BUYING PRICES

(Cents per pound, carlots, delivered)

Copper and Brass: No. 1 heavy copper and wire, 33.50; No. 2 heavy copper and wire, 31.00; light copper, 28.75; No. 1 composition borings, 26.50; No. 1 composition solids, 27.00; heavy yellow brass solids, 18.00; yellow brass turnings, 17.00; radiators, 21.00.

PLATING MATERIAL

(F.o.b. shipping point, freight allowed on quantities)

ANODES

Cadmium: Special or patented shapes, $1.70 per lb.

Copper: Flat-rolled, 58.29; oval 57.54, 5000-10,000 lb; electrodeposited, 50.28; 2000-5000 lb lots; cast, 52.54, 5000-10,000 lb quantities.

Nickel: Depolarized, less than 100 lb, $1.015; 100-499 lb, 99.50; 500-4999 lb, 96.50; 5000-29,999 lb, 93.50; 30,000 lb, 91.50. Carbonized, deduct 3 cents a lb. Prices eastern delivery.

Tin: Bar or slab, less than 200 lb, 114.50; 200-499 lb, 113.00; 500-999 lb, 112.50; 1000 lb or more, 112.00.

Zinc: Balls, 21.00; flat tops, 21.00; flats, 22.75; ovals, 22.00, ton lots.

CHEMICALS

Cadmium Oxide: $2.15 per lb, in 100-lb drums. **Chromic Acid:** Less than 10,000 lb, 28.50; over 10,000 lb, 27.50.

Copper Cyanide: 100 lb, 85.25; 200 lb, 84.50; 300 lb, 84.25; 400-900 lb, 83.50; 1000 lb, 81.50.

Copper Sulphate: 500-1900 lb, 17.90; 2000-5000 lb, 15.90; 6000 lb or more, 15.65.

Nickel Chloride: 100 lb, 46.50; 200 lb, 44.50; 300 lb, 43.50; 400-4900 lb, 41.50; 5000-9900 lb, 39.5; 10,000 lb and over, 38.50; prices eastern delivery.

Nickel Sulphate: 100 lb, 38.25; 200 lb, 36.25; 300 lb 35.25; 400-4900 lb, 30.35; 5000-35,900 lb, 31.25; 36,000 lb, 30.35; prices eastern delivery.

Sodium Cyanide: Egg, under 1000 lb, 19.80; 1000-19,900 lb, 18.80; 20,000 lb and over, 17.80; granular, add 1-cent premium to above.

Sodium Stannate: Less than 100 lb, 69.40; 100-600 lb, 61.10; 700-1900 lb, 58.60; 2000-9900 lb, 56.90; 10,000 lb or more, 55.70.

Stannous Chloride (anhydrous): Less than 25 lb, 165.90; 25 lb, 130.90; 100 lb, 115.90; 400 lb, 133.50; 5200-19,600 lb, 101.30; 20,000 lb or more, 99.10.

Stannous Sulphate: Less than 50 lb, 128.70; 50 lb, 98.70; 100-1900 lb, 96.70; 2000 lb or more, 94.70.

Zinc Cyanide: Under 1000 lb, 54.30; 1000 lb and over, 52.30.

STRUCTURAL SHAPES . . .

STRUCTURAL STEEL PLACED

5490 tons, office building, Uris Bros., 750 Third avenue, New York, to Harris Structural Steel Co., New York.

2450 tons, medical and surgical building, Gowanda, N. Y., through F. D. Rich, general contractor, to Bethlehem Steel Co., Bethlehem, Pa.

1220 tons, state bridgework, Bronx county, New York, through Rusciano Construction Co., and Del Balso Construction Corp., joint contractors, to the Phoenix Bridge Co., Phoenixville, Pa.

1200 tons, unit No. 2, power plant, Delaware Light & Power Co., Indian River, Del., to American Bridge Division, U. S. Steel Corp., Pittsburgh.

1050 tons, mill building, Bethlehem Cornwall Corp., Morgantown, Pa., through the Austin Co., engineer and contractor, to Bethlehem Steel Co., Bethlehem, Pa.

820 tons, state bridgework, Orange and Sullivan counties, New York, through George M. Brewster & Son, general contractor, to Pine Brook Iron Works, Scranton, Pa.

450 tons, state bridgework, Queens county, New York, through Tully & Di Napoli, general contractor, to Bethlehem Steel Co., Bethlehem, Pa.

175 tons, distributing house, Western Electric Co., Phoenix, Ariz., to Allison Steel Mfg. Co., that city.

100 tons, structurals and bars, bank building, Portsmouth Savings Bank, Portsmouth, N. H., to Groisser & Shlager Iron Works, Somerville, Mass., and Concrete Steel Co., Boston; Lord & Miller Inc., Melrose, Mass., general contractor.

STRUCTURAL STEEL PENDING

11,400 tons, H-beam bearing piles; bids Aug. 21, Board of Commissioners, Port of New Orleans; also 1700 tons, steel sheet piling, Aug. 14.

4780 tons, superstructure, section 5-E, Manahawkin Bay bridge, contract No. 2, Ocean county, N. J., bids closed by State Highway Department, Trenton, N. J., Aug. 7; also required are 760 tons of reinforcing steel.

3260 tons, twin bascule bridge over the north branch, Chicago river, Ohio and Ontario streets connection with Northwest highway, Chicago, for Cook county, Ill., to American Bridge Division, U. S. Steel Corp., Pittsburgh; Overland Construction Co., Chicago, contractor.

3023 tons, sec. 382, Calumet skyway, Dante to Elliott avenue, Chicago, for City of Chicago, to Allied Structural Steel Co., Chicago.

2350 tons, 95th street bridge, Calumet skyway, Chicago, for City of Chicago, to American Bridge Division, U. S. Steel Corp., Pittsburgh; Overland Construction Co., Chicago, contractor.

2850 tons, 13 grade separation structures, one stream and one railroad crossing, Connecticut turnpike project 326-01, Montville-Norwich, to Phoenix Bridge Co., Phoenixville, Pa.; Merritt-Chapman & Scott Corp., New York, general contractor; 705 tons, steel piles, to Bethlehem Steel Co.

1200 tons, Morrison street bridge, Portland, Oreg., to Independent Iron Works, San Francisco; Donald M. Drake Co., Portland, general contractor.

585 tons, five grade separation structures, Connecticut turnpike project 325-01, Waterford-Montville, to Schact Steel Construction Inc., New York; Arute Bros. Inc., New Britain, Conn., general contractor.

500 tons, Edmonds, Wash., high school, to Pointer-Williamette Co. Inc., Edmonds; Dahlgren Construction Co., Seattle, general contractor.

235 tons, state highway bridge, Putnam, Conn., to McDermott Steel Specialties Inc., New Haven, Conn.; Brunalli Construction Co., Southington, Conn., general contractor; 55 tons, reinforcing, to Bethlehem Steel Co., Bethlehem, Pa.

250 tons, including joists, manufacturing plant, Detroit Controls Corp., Belknap Mfg. Co., Stratford, Conn., to A. O. Wilson Structural Co., Cambridge, Mass.; (joists) Bethlehem Steel Co., Bethlehem, Pa.; Gilbane Building Co., Providence, R. I., general contractor.

250 tons, channels, general stores supply,

FOR SALE

MESTA 2000 TON HYDRAULIC FORGING PRESS, bed 5' LR x 16'7" FB. Daylight 111", 36" stroke. Fully equipped. 4 column type, 17" column. Now setup in Navy plant. Recently rebuilt. Price $12,500.

EVEREADY; P. O. BOX #638, BRIDGEPORT, CONN. EDison 4-9471

FOR SALE

We're selling at LOW PRICES only: Turnbuckles; Clips; Woodblocks; Thimbles; Shackles; Eye Bolts; Large Bolts & Nuts; Wood & Machine Screws; Steel Brass, Etc. We'll send you our Lists or send us your inquiries, we will wire availability & price.

TOP INDUSTRIAL SALES CO.
345 Canal St. New York 13, N. Y.

Steel Castings Sales Engineer

Progressive southwestern foundry seeks steel castings sales engineer with background of productive experience. Man sought is probably now top bracket salesman or assistant executive with promotion blocked by senior many years away from retirement. This is an unusual career opportunity for graduate engineer with superior qualifications, outstanding record and demonstrated capacity for executive development. Apply in own handwriting enclosing complete biographical information and recent photograph.

Reply Box 441, STEEL

Penton Bldg. Cleveland 13, Ohio

TUBE MILL FOREMAN

Familiar with all phases of manufacturing stainless steel tubing. Growing concern. Excellent opportunity for the future. Location—New England. Will pay relocation expenses.

Write Box 443, STEEL
Penton Building Cleveland 13 Ohio

CLASSIFIED

Help Wanted

SALESMAN WANTED — A leading manufacturer looking for a man, 28-42, who is familiar with steel mill operation and organization. Must have proven sales record and engineering background with the steel industry. Present opening in the So. Chicago-Gary, Ind. area. Straight salary, bonus, expenses and car furnished. Unlimited opportunity for advancement and income for the man who can meet the challenge. Reply giving outline of experience. Box 446, STEEL, Penton Bldg., Cleveland 13, Ohio.

CLASSIFIED RATES

All classifications other than "Positions Wanted," set solid, 50 words or less $15.00, each additional word .30, all capitals, 50 words or less $19.20, each additional word .38; all capitals leaded, 50 words or less $23.40, each additional word .47. "Positions Wanted" set solid, 25 words or less $3.60, each additional word .14; all capitals, 25 words or less $4.50, each additional word .18; all capitals leaded, 25 words or less $5.40, each additional word .22. Keyed address takes seven words. Cash with order necessary on "Positions Wanted" advertisements. Replies forwarded without charge. Displayed classified rates on request. Address your copy and instructions to STEEL, Penton Building, Cleveland 13, Ohio.

THERMALLOY* research at work

hawkshaw

There are 100 more like him... to solve heat-treat "headaches"

He is an Electro-Alloys research chemist. His job is to help develop Thermalloy "remedies" for the prevention of industrial wear. His base of operations is our well-equipped research laboratory at Elyria.

If a particularly complex problem arises, he can call on *more than 100* metallurgists, engineers, chemists and other technicians at our American Brake Shoe research center in Mahwah, New Jersey. This research center offers the most modern and complete facilities available in the industry.

Let us put these unexcelled research facilities to work for *you*. Call your local Electro-Alloys representative, or write Electro-Alloys Division, 7047 Taylor Street, Elyria, Ohio.

*Reg. U. S. Pat. Off.—designating not just one but a *group* of alloys —each developed to meet a specific heat and abrasion problem.

HEAT-RESISTANT CASTINGS • TRAYS • MUFFLES
RETORTS • CONVEYOR BELTS • RADIANT TUBES

AMERICAN Brake Shoe COMPANY

ELECTRO-ALLOYS DIVISION
Elyria, Ohio

Navy, Philadelphia, delivery east and west coasts.

200 tons, three state bridges, Spaulding turnpike, Rochester, N. H.; also 75 tons, reinforcing bars; Campanella & Cardi Construction Co., Hillsgrove, R. I., low on general contract.

100 tons, three state bridges, disaster project, Stafford, Conn., to American Bridge Division, U. S. Steel Corp., Pittsburgh; Stanley J. Ziobro, Seymour, Conn., general contractor.

REINFORCING BARS . . .

REINFORCING BARS PLACED

600 tons, Jefferson High School, Seattle, to Joseph T. Ryerson & Son Inc., Seattle; Henrik Vallee Inc., Seattle, general contractor.

475 tons, five grade separation structures and culverts, Connecticut turnpike project 325-01, Waterford-Montville, to Bethlehem Steel Co., Bethlehem, Pa.; Arute Bros. Inc., New Britain, Conn., general contractor.

250 tons, bars and structurals, wing addition, Providence Lying-In Hospital, Providence, R. I., to Plantations Steel Co., Providence, (structurals) American Architectural Iron Co., Boston; Gilbane Building Co., Providence, general contractor.

130 tons, men's dormitory, Vanderbilt University, Nashville, Tenn., to Laclede Steel Co.

REINFORCING BARS PENDING

5800 tons, Wahluke siphon, Columbia basin project; alternatives invited; bids to Bureau of Reclamation, Ephrata, Wash., Aug. 21.

3000 tons, first phase of Rocky Reach power project, Columbia river; Arundel Corp., Baltimore, L. E. Dixon Co., San Gabriel, Calif., Hunkin, Conkey Construction Co., Cleveland, and American Pipe & Construction Co., Los Angeles, joint low at $12,038,091, to Chelan county P.U.D. No. 1, Wenatchee, Wash.

760 tons, Manahawkin Bay bridge, section 5-E, contract No. 2, Ocean county, N. J., bids to be closed by the State Highway Department, Trenton, N. J., Aug. 7; also required are 4780 tons of structurals and 4408 ft of metal railing.

300 tons, Washington state, flat slab bridge, Thurston county; general contract to MacRae Bros., Seattle, low at $382,383.

PLATES . . .

PLATES PLACED

200 tons, submarine salvage pontoons, Navy, to National Steel & Shipbuilding Corp., San Diego, Calif.

PLATES PENDING

1900 tons, Wahluke siphon project, Columbia basin; bids to Bureau of Reclamation, Ephrata, Wash., Aug. 21.

PIPE . . .

CAST IRON PIPE PLACED

1000 tons, 20, 48, 60 and 72-in. steel pipe, in connection with state project 56-1, Queens county, New York, through Tully & Di Napoli, general contractor, to Alco Products Inc., New York.

RAILS, CARS . . .

RAILROAD CARS PLACED

Illinois Central, 200 seventy-ton covered hopper cars, to Pullman-Standard Car Mfg. Co., Chicago.

Chicago & Northwestern, 15 fifty-ton boxcars, to Pullman-Standard Car Mfg. Co., Chicago.

Norfolk & Western, 25 fifty-ton boxcars, to Pullman-Standard Car Mfg. Co., Chicago.

Chicago, Rock Island & Pacific, 300 seventy-ton gondolas, to Pullman-Standard Car Mfg. Co., Chicago.

Pittsburgh & West Virginia, 100 seventy-ton gondolas, to Pullman-Standard Car Mfg. Co., Chicago. (This replaces previous order for 100 fifty-ton boxcars.)

Canadian National, five dinette cars, to Canadian Car & Foundry Co. Ltd., Montreal, Que.

LOCOMOTIVES PLACED

Kansas, Oklahoma & Gulf, two 1750-hp diesel-electric units, to Electro-Motive Division, General Motors Corp., La Grange, Ill.

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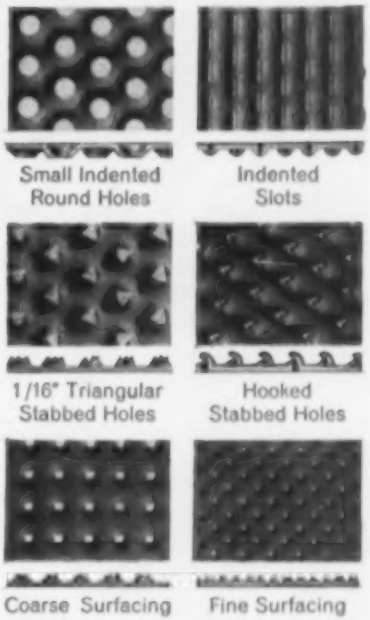
H&K

SURFACED PERFORATIONS

are used in many products



Small Indented Round Holes

Indented Slots

1/16" Triangular Stabbed Holes

Hooked Stabbed Holes

Coarse Surfacing

Fine Surfacing

Illustrated are only a few of the many surfaced perforations for which we have dies. We have thousands of different die patterns to perforate practically any metal in sheets, rolls and coils.

If your product requires surfaced perforated materials, contact either H & K office or one of our agents. We will be glad to work with you on your perforating requirements.

Fill in and mail coupon to office and warehouse nearest you.

FIND NEAREST H&K AGENT in the "Yellow Pages"

Listed Under "Perforated Metals"

THE Harrington & King PERFORATING CO.

Chicago Office and Warehouse: 5627 Fillmore Street, Chicago 44, Ill.

New York Office and Warehouse: 118 Liberty Street, New York, N. Y.

Please send me—

- ☐ GENERAL CATALOG NO. 62
- ☐ STOCK LIST of Perforated Steel Sheets
- ☐ SAMPLES of Perforated Plastics and Paper
- ☐ PRICE INFORMATION (NOTE: Send specifications of perforated materials wanted. If necessary send drawings or sketches.)

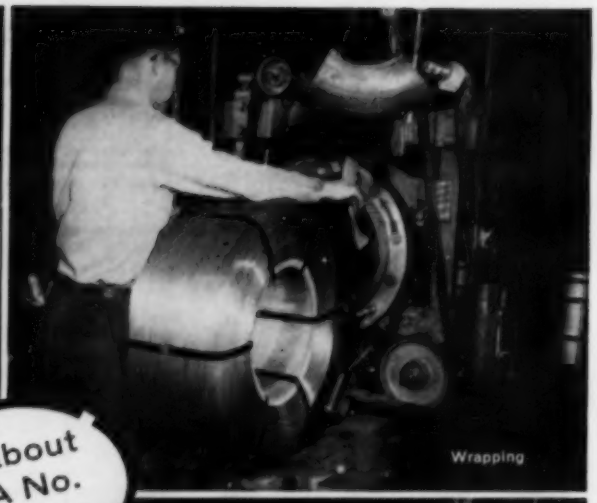
NAME_____

TITLE_____

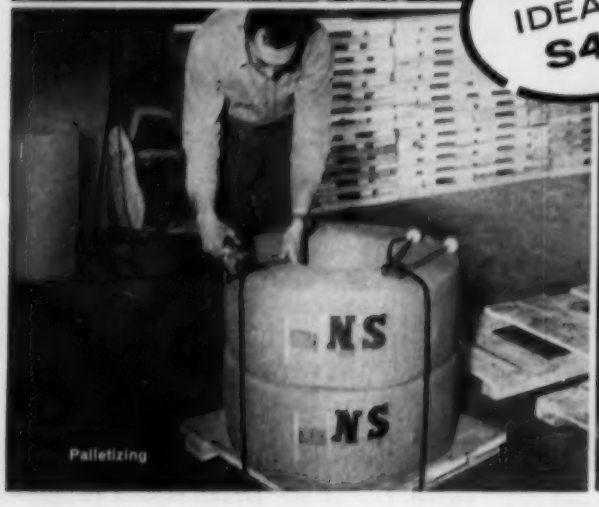
COMPANY_____

STREET_____

CITY_____ ZONE_____ STATE_____



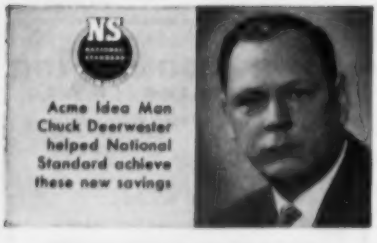
ask about IDEA No. S4-4



National-Standard has patents pending on certain equipment for this operation.

Check your AIM* . . . National-Standard did

Steel strapping idea cuts two big costs



NATIONAL-STANDARD COMPANY of Niles, Michigan, with an important assist from Acme Steel, has cut *shipping* and *handling* costs for its customers in the packaging of tire bead wire.

This wire formerly was shipped on returnable steel reels, for which the customer was charged—then credited when reel was returned. Wire is now wound on a fibre core placed on a collapsible reel. Acme Steel Strapping is applied, reel is dismantled, and coil of wire is ready for wrapping and palletizing. Reel charges are abolished, freight costs to customers are cut, and palletizing with steel strapping is simplifying handling and storage problems.

***Check YOUR Acme Idea Man.** He will work with you—give you Acme Steel Strapping ideas to help you with your packaging and shipping problems. Call him at the nearest Acme Steel offices, or write Dept. SDS-86, Acme Steel Company, 2840 Archer Avenue, Chicago 8, Illinois.

ACME STEEL STRAPPING

ACME STEEL

always SOMETHING NEW in making butt weld pipe...

● Seldom will you see two butt weld pipe mills exactly alike. Each mill has individual ideas for the specific producer.

Many ideas originate with the pipe producer, who joins with Aetna in developing the equipment. Many ideas originate with Aetna and should... we design and build more butt weld pipe mills than any other manufacturer.

Here are two familiar examples — the Rotary Hot Saw and the Rotary Kick-out. Right now, Aetna's engineers have several ideas on the drawing boards for butt weld pipe. You will hear about them soon.

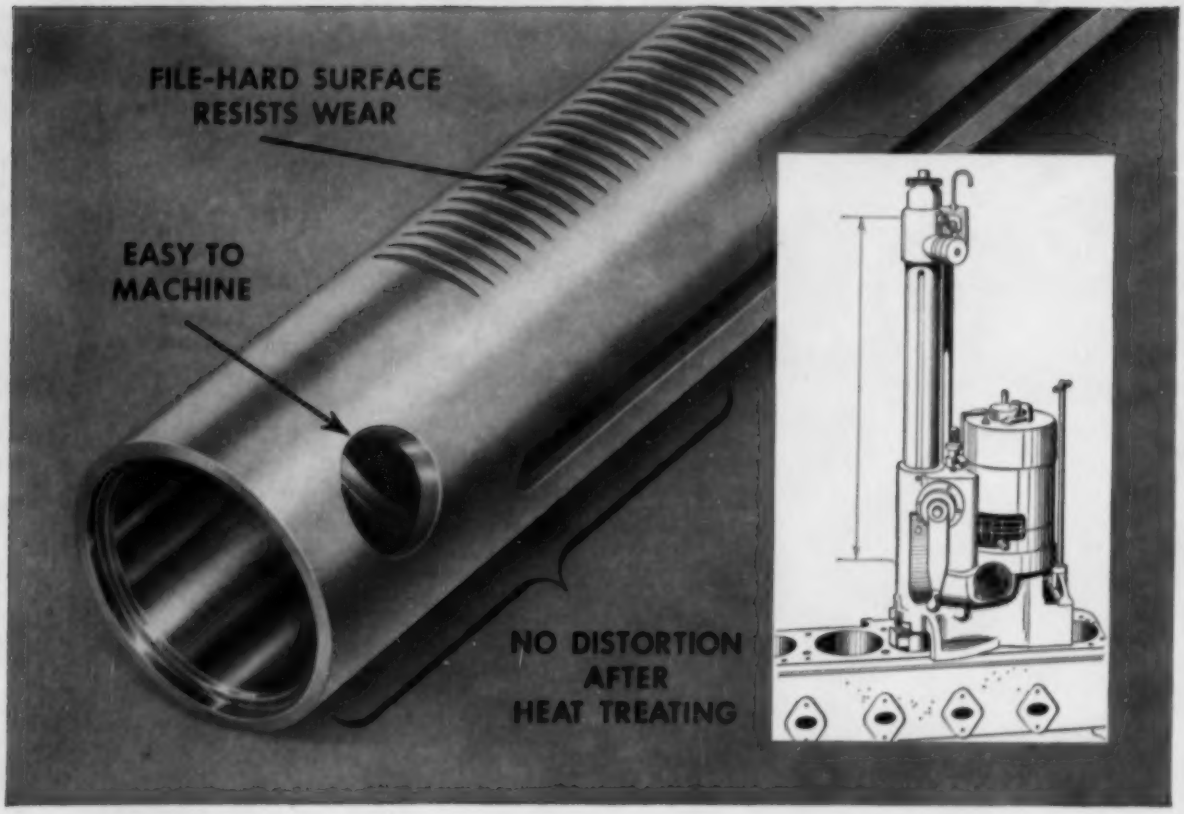
Whether your present pipe mill needs modernizing or replaced, Aetna-Standard is the manufacturer with the experience and the new ideas.

AETNA • STANDARD

THE AETNA-STANDARD ENGINEERING COMPANY

GENERAL OFFICES: PITTSBURGH, PA. **PLANTS: ELLWOOD CITY, PA., WARREN, OHIO**

CONTINUOUS GALVANIZING LINES • CONTINUOUS ELECTROLYTIC TINNING LINES • SIDE TRIMMING AND SHEAR LINES AND OTHER FINISHING EQUIPMENT • CONTINUOUS BUTT WELD PIPE MILLS • SEAMLESS TUBE MILLS • DRAWBENCHES AND OTHER COLD DRAW EQUIPMENT • ROLLS AND CASTINGS • EXTRUDERS, MILLS, PRESSES FOR RUBBER AND PLASTIC



Boring bar maker solves heat-treat distortion problem by switching to TIMKEN® 52100 steel

HEAT-TREATING distortion was running up the manufacturing costs of the boring bars Van Norman Automotive Equipment Company makes for reboring hard-sleeve cylinder blocks. The column of the boring bar, which acts as the spindle, had to be extremely straight. Yet many of them were distorting after heat treatment. And that meant putting them through an extra straightening process.

Studying the problem, metallurgists of the Timken Company suggested a switch to Timken® 52100 steel. Since this steel is hard and tough, it had the qualities Van Norman wanted. And because it responds uniformly to heat treatment it proved to be the answer to their production problem.

By switching to Timken 52100 steel, Van Norman eliminated the need for the costly straightening operation. And as a bonus, they've found that Timken 52100 steel is easier to machine than the steel they previously used.

The Timken Company pioneered the development of 52100 and is one of the principal producers of the steel—the only source of the grade in three finished forms: bars, tubing and wire. You can rely on the Timken Company for small run or emergency requirements as well as mill quantities.

We stock 101 sizes of 52100 steel, ranging from 1″ to 10½″ O.D. For a complete stock list of available sizes, grades and finishes, write The Timken Roller Bearing Company, Canton 6, Ohio. Cable: "TIMROSCO".

YEARS AHEAD—THROUGH EXPERIENCE AND RESEARCH

SPECIALISTS IN FINE ALLOY STEELS, GRAPHITIC TOOL STEELS AND SEAMLESS STEEL TUBING